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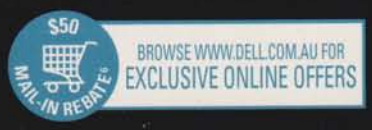

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- Intel® 3D Direct AGP Graphics
- 48X Max CD-ROM
- 15" Colour Monitor (13.8"v.i.s.)
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- 10GB[1] HDD
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- Sound Blaster compatible Audio
- 24X Max CD-ROM ■ 3.5" FDD
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- Microsoft® OEM Works Suite 2001
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NEW

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- 10GB[1] HDD ■ 3.5" FDD
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- 14.1" XGA TFT Display (1024x768 res)
- 3D Positional Sound with Wavetable
- 24X Max CD-ROM
- Microsoft® Windows® Millennium Edition
- Microsoft® OEM Works Suite 2001
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- Integrated Dual ATA-100 EIDE Controller
- Integrated Ultra 160/M SCSI Controller
- Integrated 16-Bit Sound
- 48X Max Variable EIDE CD-ROM Drive
- Microsoft® Windows 2000
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Optional 19" Trinitron (18" v.i.s.) – add $847*

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DIMENSION™ 2100

- Intel® Celeron™ Processor 900MHz
- 128MB PC100 Shared[7] SDRAM ■ 20GB[1] HDD
- Intel 3D Direct AGP Graphics
- Creative Labs SoundBlaster 64Voice PCI Sound Card
- 48X Max CD-ROM ■ PC Stereo Speakers
- 15" Colour Monitor (13.8"v.i.s.) ■ 56K Modem
- Microsoft® Windows® XP Home Edition
- Microsoft® Works Suite 2001 – OEM version
- 1-Year Limited Warranty (with 1-Year Next Business Day On-site[2] Service)

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Optional 19" Trinitron (18" v.i.s.) – add $847*

Value Multimedia Package

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- Intel® Pentium® 4 Processor 1.6GHz
- 128MB 133MHz SDRAM ■ 20GB[1] HDD
- 16MB ATI RAGE Ultra 4X AGP Graphics Card
- SoundBlaster Live! Value 576Voice Sound Card
- 48X Max CD-ROM ■ Harmon Kardon® Stereo Speakers
- 15" Colour Monitor (13.8"v.i.s.) ■ 56K Modem
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Pictured with optional 19" (18" v.i.s.) Trinitron Monitor – add $677*

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- Intel® 850 Chipset ■ 256MB RDRAM ■ 20GB[1] HDD
- 17" Colour Monitor (15.9"v.i.s.)
- 32MB DDR NVIDIA GeForce2 GTS 4X AGP Graphics Card
- SoundBlaster Live! Value 576Voice Sound Card
- 16x Max DVD-ROM ■ PC Stereo Speakers
- Microsoft® Windows® Millennium Edition
- 56K modem ■ Microsoft® OEM Works Suite 2001
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- 10GB[1] HDD ■ Intel® Integrated 3D AGP graphics
- 24X Max CD-ROM ■ Case
- 3.5" FDD ■ Sound Blaster compatible Audio
- 14.1" XGA TFT Display (1024x768 res)
- Microsoft® Windows® Millennium Edition
- Microsoft Works Suite 2001 - OEM version
- Internal Mini-PCI 56K Capable Fax Modem
- 1-Year Limited Warranty (Next Business Day On-site[2] Service)

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- 14.1" Super XGA+ TFT Display (1400x1050 res)
- Microsoft® Windows® Millennium Edition
- Microsoft Works Suite 2001 - OEM version
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- 1-Year Limited Warranty (Next Business Day On-site[2] Service)

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- 32MB DDR 4X AGP NVIDIA® GeForce2 Go™ 3D Video
- 3.5" FDD ■ 24X Max CD-ROM ■ Case
- 3D Positional Sound with Wavetable
- Harman/Kardon® Odyssey® 2 Speakers (Internal)
- 15" Super XGA+ TFT Display (1400x1050 res)
- Microsoft® Windows® Millennium Edition
- Microsoft Works Suite 2001 - OEM version
- Internal Mini-PCI 56K Capable Fax Modem
- 1-Year Limited Warranty (Next Business Day On-site[2] Service)

Plus your choice of 1 FREE bonus from: Upgrade to 8X Max DVD-ROM, Lexmark Z32 printer, or Black Keyboard/Mouse/Harmon Kardon speakers

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A NEW LANDMARK

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The NEW Inspiron™ 8100 is a first from Dell™. It looks like a notebook, but on the inside it's a whole new machine offering the NEW Mobile Intel® Pentium® III Processor 1.2GHz – M, PC133 SDRAM, and on-die 512K L2 cache to give you ultimate speed and power on the road.

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- 512KB L2 Cache
- 256MB SDRAM
- 20GB[1] HDD ■ 3.5" FDD
- 32MB DDR 4X AGP NVIDIA® GeForce2 Go™ 3D Video
- 3D Positional Sound with Wavetable
- 8X Max DVD-ROM
- Harman/Kardon® Odyssey® 2 Speakers (Internal)
- 15" Super XGA+ TFT Display (1400x1050 res)
- Microsoft® Windows® Millennium Edition
- Microsoft® Works Suite 2001 – OEM version
- Internal Mini-PCI 56K Capable Fax Modem
- 1-Year Limited Warranty (Next Business Day On-site[2] Service)

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AN UNBELIEVABLE PRICE

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- 128MB 133MHz SDRAM ■ 20GB[1] HDD
- 48X Max CD-ROM ■ 3.5" FDD
- 15" Colour Monitor (13.8"v.i.s.)
- 16MB ATI RAGE Ultra 4X AGP Graphics Card
- Integrated AC97 Audio
- Mouse ■ Keyboard
- Microsoft® Windows® XP Home Edition
- Microsoft® OEM Works Suite 2001
- Norton Anti-Virus 2001 – OEM
- 1-Year Limited Warranty (1 Year Next Business Day On-site[2] Service and 1 Year Parts)

Dell Dimension™ 4300 pictured with optional 19" (18"v.i.s) Trinitron Monitor, add $847*.

$1,699* VALID TILL 9/11/01 PRICE INCLUDES GST. DELIVERY ADDITIONAL

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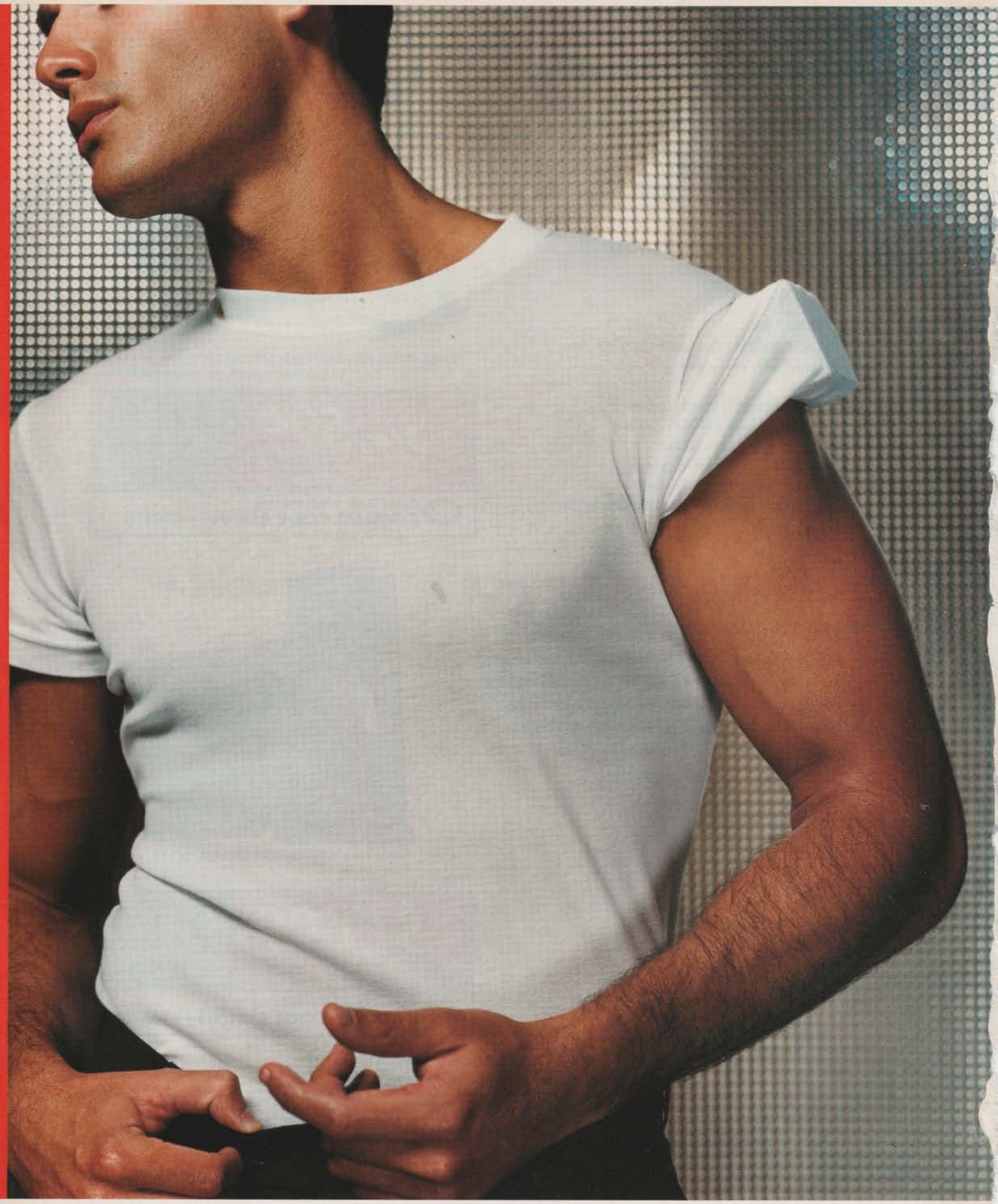

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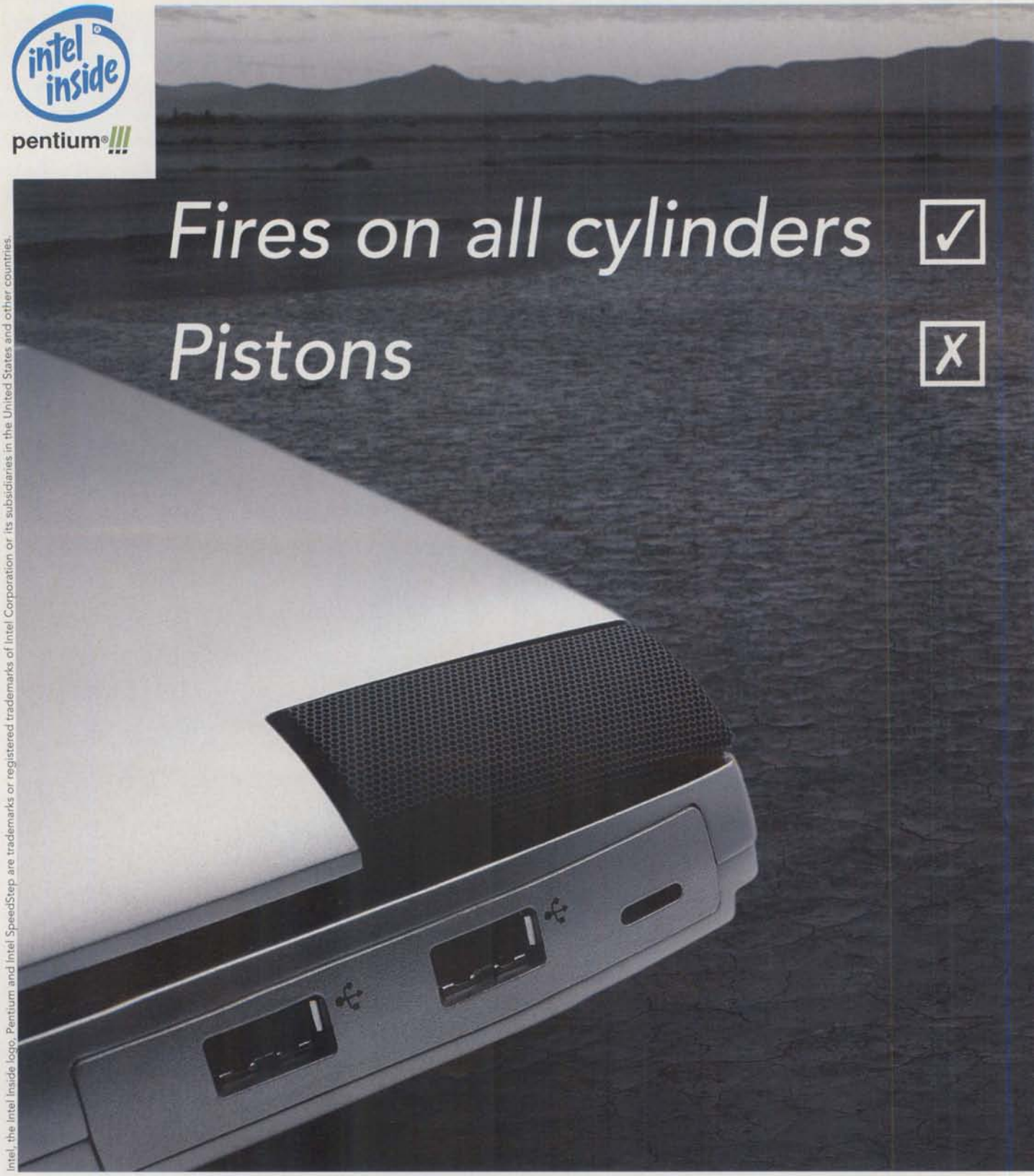

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OBJECTIVE: Build top-of-the-line notebooks that deliver the all-round refinement of class-leading sports cars. METHOD: Zoom in on the user experience. Eliminate key irritations and bottlenecks. Streamline, relentlessly. RESULT: Machines that effortlessly overtake everything else on the road.

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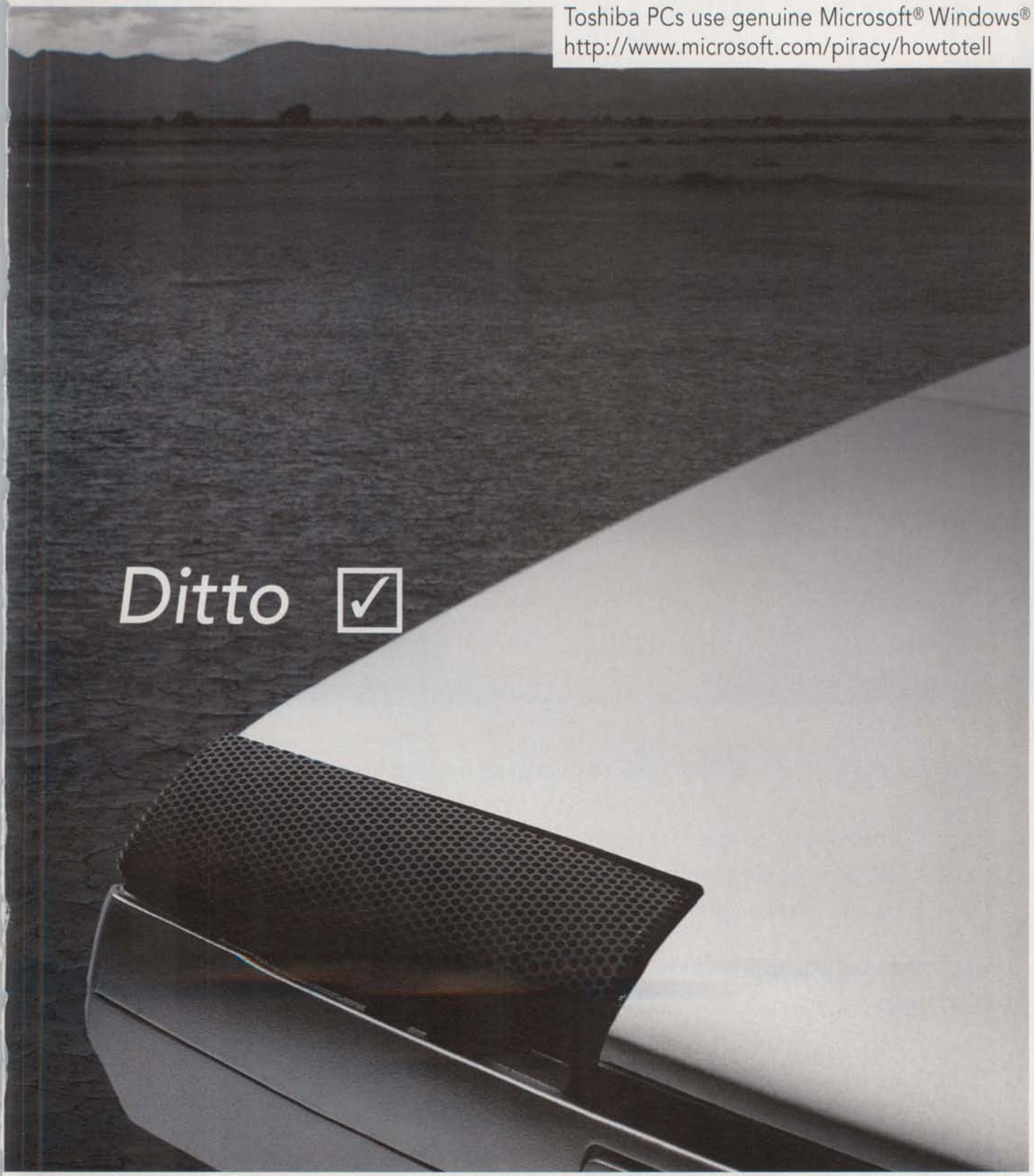
Toshiba PCs use genuine Microsoft® Windows®
http://www.microsoft.com/piracy/howtotell



Portége 4000 with Mobile Intel® Pentium® III processor featuring Intel® SpeedStep™ technology and Toshiba Tecra 9000 with Mobile Intel® Pentium® III processor-M.

systems keep the adrenaline pumping: Intel® Pentium® III processors drive blistering performance: radical styling generates powerful feelings of envy in observers. ACTION: Test drive the Portége 4000 or Tecra 9000 at your Toshiba reseller. For information call 1800 021 100 or visit www.isd.toshiba.com.au

*Microsoft® Windows XP Professional upgrades available when launched, and installed by your reseller. Preinstalled on Toshiba Tecra 9000 and Portége 4000 from Dec 2001.

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It's a whole new world out there.

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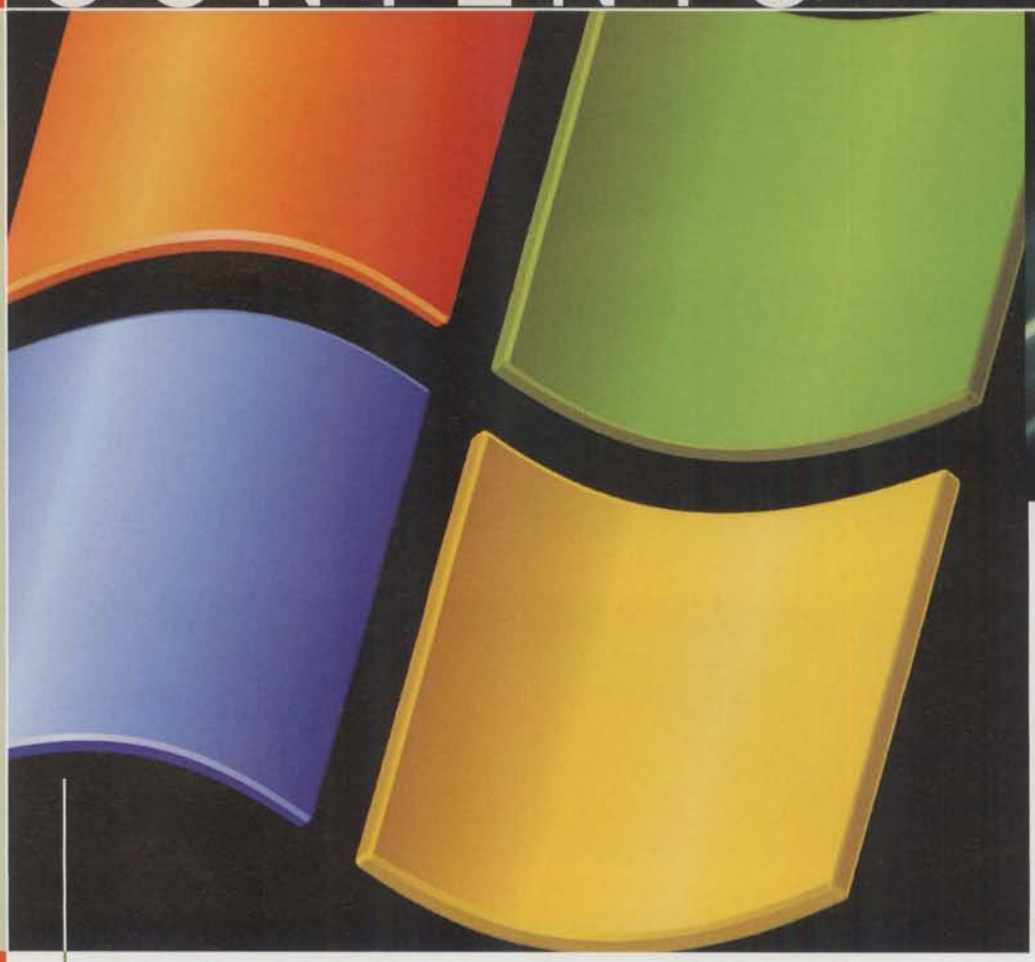

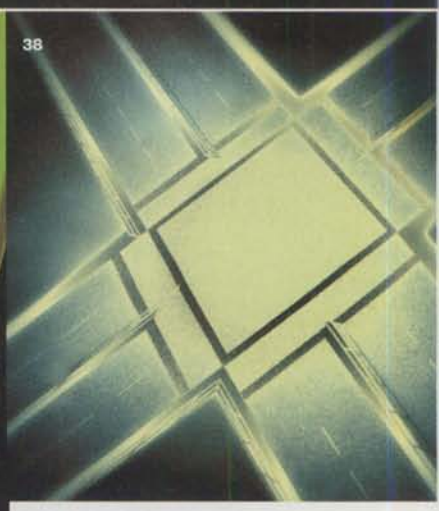

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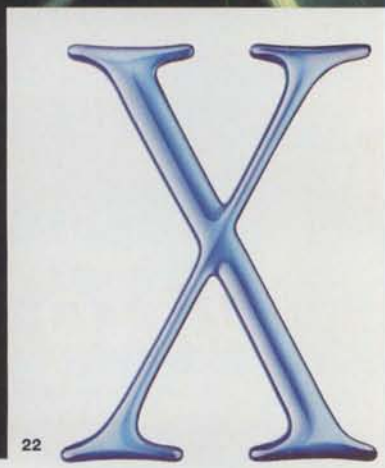

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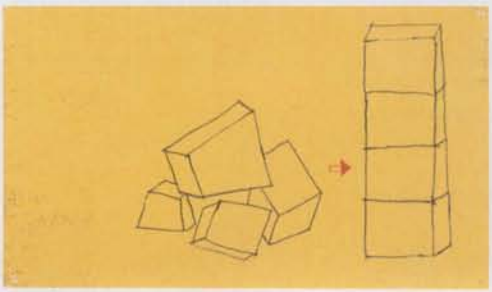

apcmag.com

Wow, what a month it has been at apcmag.com! After a much-deserved post-launch break, the apcmag.com Web team have been busy cranking out the latest features, reviews and all new Workshop columns for your online viewing pleasure. Many thanks for the tons of feedback we've received about the site. In coming months, we'll be looking to tweak it using some of your constructive suggestions.

JAM PACKED

Visit apcmag.com this month and you'll see we've managed to cram even more useful additions into our site. Now you can share your opinions with fellow APC readers on articles we've posted on the site, rather than in a general discussion forum. Just click on the Discuss link in any article. Also, you can now log into your Hotmail email account directly from apcmag.com by entering your details into the Hotmail message centre at apcmag.com.

APC UPDATE

This month sees the birth of the *APC* weekly email. Inside the *APC* Update you'll find a roundup of the week's postings from apcmag.com and a site update on the competitions and exclusive promotions on offer. To sign up, head to **www.apcmag.com** and click on the *APC* Update link.

As always, the apcmag.com team welcomes your opinions. So please jump online and tell us what we can do to keep making apcmag.com a great resource for you.

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This hot new release boasts advanced security features, improved cookie control and P3P (Platform for Privacy Preferences) support. It runs only on Windows 98 or higher, so Windows 95 users are stuck with IE5.5. Of course, there's always Netscape 6.1!

WORD X

Test drive the prerelease version of Microsoft Word X for Mac. *APC* gives you a sneak peek at how Microsoft is taking advantage of the new technology in Mac OS X version 10.1.

IMPROVED TOOLKIT

Your essential software toolkit just got even better. This month, we asked our Windows, Mac and Linux experts to pick their favourite programs, and we put them all together in a kit no PC should be without.

WE'RE TAKING REQUESTS

Tired of trying to download that 40Mb file? Check out our brand-new section devoted to wish fulfilment. If you'd like to see a particular product on our CD, we want to hear about it. This month, readers asked for the Windows 2000 Service Pack 2, OS/2 Warp 4 Fixpak 15, Bryce 5 and Game Maker 4.

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> *APC* does not provide support for programs included on the CD.
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Web www.apcmag.com/cd
Phone (02) 9288 9123

WINDOWS XP SUPERGUIDE

To complement our mammoth superguide on Windows XP, the CD includes:

> Microsoft's official Upgrade Advisor, to help you determine whether your PC is ready for XP.
> Our exclusive try-before-you-buy CD set of Symantec's Norton 2002 range — Norton AntiVirus and Norton Internet Security are built for XP, and have been updated for Windows 9x, NT and 2000.
> The very latest version of ZoneLabs' ZoneAlarm firewall: ready for XP and better than Windows' own built-in firewall.

TIME TO PLAY!

Arcanum: Of Steamworks and Magick Obscura Addiction barely describes it. Arcanum is one of those games that is constantly on your mind — even when you should be concentrating on other things. Like working. Or *eating. Or sleeping.*

ilisys

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Lite $120/yr		5 MB		s		L				•				•		500 MB
Basic $199/yr		20 MB	1	u	•	L/NT	•		•	•				•	•	1 GB
Plus $275/yr		20 MB	15	u	•	L/NT	•		•	•				•	•	1 GB
SoHo $399/yr		50 MB	30	u	•	L/NT	•	•	•	•	•	•		•	•	1 GB
Standard $489/yr		100 MB	50	u	•	L/NT	•	•	•	•	•	•	•	•	•	2 GB
Heart $599/yr	•	200 MB	75	u	•	L/NT	•	•	•	•	•	•	•	•	•	2 GB
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UK & Australian domain fees cover registration for 2 years

Comparison with other web hosters as taken from their websites on 24 September 2001

Domain name costs are for 2 years and include GST-

Company	ilisys	Telstra	Web Central	Commander	NetRegistry
.com .net .org	$40	$165	$66	$66	$110
.com.au	$110	$165	$135	$135	$140

Entry-level domain hosting packages

Specifications vary from package to package

Company	ilisys	Telstra	Web Central	Commander	Net Registry
Hosting package	basic	-	Economy	Bronze	The Promoter
Server space	20 MB	-	20 MB	20 MB	35 MB
Monthly transfers	1 GB	-	500 MB	500 MB	1 GB
Domain name .com	$40 for 2 years	-	$66 for 2 years	$66 for 2 years	$110 for 2 years
Set up fee	0	-	$64	$59	$108.90
Cost of basic package	$199	-	$420	$370	$382.80
Total including GST.	$239	-	$550	$495	$601.70

Business Packages

Specifications vary from package to package

Company	ilisys	Telstra	Web Central	Commander	Net Registry
Hosting package	Standard	Business	Business	Platinum	The Business
Server space	100MB	100MB	70MB	1 GB	50MB
Monthly transfers	2 GB	1 GB	750 MB	2GB	1.5 GB
Domain name .com	FREE for 1 year	$165 for 2 years	$66 for 2 years	$66 for 2 years	$110 for 2 years
Set up fee	0	$110	$97	$99	$108.90
Cost of basic package	$489	$1320	$665	$2990	$778.80
Total including GST.	$489	$1,595	$828	$3,155	$997.70

For information about our Reseller programme and RaQ prices please go to our website

www.ilisys.com.au Freephone: 1800 999 618

apc

AUSTRALIAN PERSONAL COMPUTER

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ISSUE 275 NOVEMBER 2001

This month's cover says it all. Windows XP is here. And if you're using any flavour of Windows — from Windows 95 to Me to 2000 — XP will almost certainly be your next operating system.

Here at *APC* we've been running XP on our work and home machines for months. I've been fiddling with it since last year's beta 1 release under the 'Whistler' codename. And quite honestly, we're all pretty impressed. Now we find it painful to have to jump back onto a 9x or 2000 machine, especially as we've become accustomed to XP's clever little tricks and courtesies. We've even learned to live with that big lolly-green lozenge of a Start button!

So should you rush out and buy XP? Not without reading our mammoth XP feature. Our 25-page guide gives you a detailed look at this next-gen OS from every angle. Windows XP deserves that much space because it's that significant a product.

The Windows platform has improved by degrees with every release; some, like Windows 98 and Windows 2000, more substantially than others, like Windows Me.

With Windows XP, however, it's pretty clear that Microsoft has finally got Windows right. It's good enough to load on my Dad's home PC, because I know he'll get more fun out of using his computer. He'll do more stuff, and he'll do it more easily than he can in Windows Me.

And that's why we have operating systems — not to get in the way, but to pave the way for us to do the things for which we all buy a PC in the first place.

Mind you, if I was buying my Dad a *new* PC, I'd be tempted to buy him an iMac. This month, the *APC* team has also spent some time with Apple's new 10.1 update to Mac OS X (we've even managed to scoop the Macintosh magazines with our review!), and it's one sweet piece of work. It could well be the OS that Windows would like to be.

If Apple's operating system was available for Windows machines — if you could buy a brand-name Intel or AMD-powered PC slapped with a 'Mac Approved' sticker and a preloaded copy of Mac OS X — Microsoft would have some *real* competition.

David Flynn

IF YOU'VE EVER HAD A COMPUTER PROBLEM, YOU'VE JUST FOUND THE 7 GREAT WONDERS OF THE WORLD.

History's lesson is clear—McAfee has long stood for uncompromising computer safety. The worldwide leader in anti-virus protection,* McAfee has seven unique products that bring you a full range of PC utilities. So you can keep your computer shielded from viruses, hackers, explicit Web sites, credit card theft and more. McAfee can even protect your wireless devices, Macintosh and the latest PC operating systems. Visit your local retailer, and see how easy it is to have one of the first names in computer security be there protecting you. Just as it always has been.

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NEED TO

VROOM **VROOM**

Pentium-powered petrol heads can really put the pedal to the metal with Logitech's new Momo Force driving kit. The hand-stitched leather steering wheel sports six programmable buttons mounted on an aluminium centre plate, with 270° of wheel rotation, steel paddle shifters, and force feedback technology to make every bump and corner feel almost too real. The metal plate floorboard is fitted with aluminium accelerator and break pedals. At this price, it's cheaper than a couple of speeding tickets.

Contact *Logitech Australia Computer Peripherals* ***Phone*** *(02) 9972 3711*
Online *www.logitech.com* ***Price*** *$499*

POCKET **ROCKET**

Now we know what was behind Steve Ballmer's outrageous on-stage paroxysms — it was a war dance to declare a new round of hostilities with Palm, which still outsells Microsoft's handhelds by roughly four to one.

Their latest salvo is the Pocket PC 2002, fourth generation in the family of Windows-based handhelds sporting more memory and raw processing power than a full-sized notebook of five years ago.

The first Pocket PC 2002 model to land on our shores is Hewlett-Packard's Jornada 565. Like the Compaq and Toshiba models to follow, it contains a pared-down version of Office and a new interface with the gloss and glam of Windows XP.

Contact *Hewlett-Packard* ***Phone*** *13 23 47*
Online *www.hp.com.au* ***Price*** *TBA*

ACTION!

Looking like a high-tech super-8 video camera, the upcoming Intel Play Digital Movie Creator places kids in the role of movie director. The camera has two recording modes, high-res or low-res (which allows for up to four minutes of recorded video and audio, or for hundreds of still photos). The editing suite is easy to use, and comes with transition effects and lots of stock footage from NASA and *National Geographic*. Great for emailing movies, capturing video diaries and all kinds of mischief.

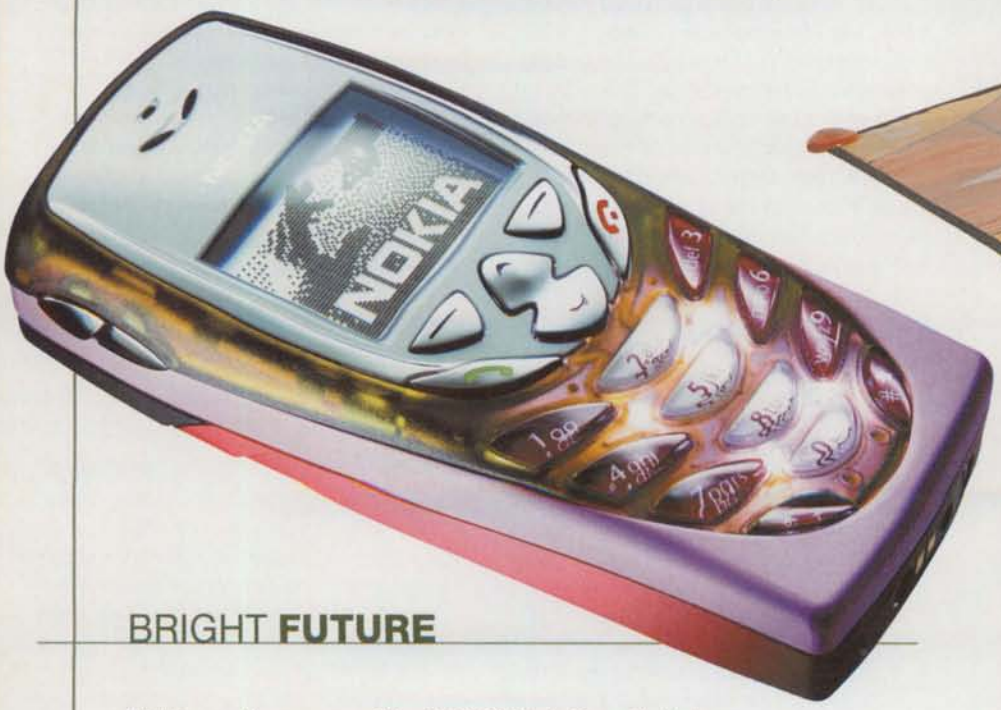
Contact *Intel* ***Phone*** *1300 36 3018*
Online *www.intel.com.au* ***Price*** *TBA*

KNOW

GO **WILD**

If adventure is your middle name, the STM Sports backpack lets you bring your laptop along for the ride. It's got enough pockets for a field sampler and is tough enough to handle a hike. Strapped into the main protected compartment, it spreads your laptop's weight evenly across your back and surrounds it in smooth padding. The top zipped pouch hides an MP3 player, and a special rubber-lined heaphone opening lets you listen and hike at the same time. The broad shoulder straps are lined with a comfy mesh and there's even a waist clip for when your workload gets *really* heavy.

Contact *STM* ***Phone*** *0414 305 440*
Online *www.standardtm.com.au* ***Price*** *$120*



BRIGHT **FUTURE**

Building on the success of the 8210/8250 platform, Nokia has released a wild-child version of the series in the same tiny form factor. In what looks like an 8210 in full opera make-up, the 8310 features a 'tridimensional' design combining extroverted colours and translucent plastics. It also offers GPRS2, SMS Chat2 and an integrated mono FM radio.

Contact *Nokia* ***Phone*** *1300 366 733*
Online *www.nokia.com.au* ***Price*** *$1,199*

CUT AND **THRUST**

All the pleasure of beating the crap out of someone with none of the consequences like jail, or worse, getting hit back. The meatheads at Thrustmaster may well have stumbled on the antidote to civic violence. The Thrustmaster FightingArena lets you live out Fight Club-style dreams on the PlayStation platform, while putting to rest claims that gaming is slothful. The footpads are pressure sensitive to move you around your chosen den of violence, and the corner poles have infra-red sensors to register your hellacious kicking and punching assault on all manner of animated characters. Now you can take up soap-making just for fun.

Contact *Cassa Australia* ***Phone*** *1300 365 047*
Online *au.thrustmaster.com* ***Price*** *$199*

Watchful eyes: Computer hackers may soon be subject to terrorism laws.

HACKERS COP ANTI-TERRORIST FLAK

PROPOSED LAWS IN THE US AND AUSTRALIA COULD PUT HACKERS IN THE SAME CLASS AS TERRORISTS.

It happens all the time. A Net user hacks into an ISP looking for account information. Someone jokingly defaces a popular Web site. Are these just harmless pranks, or are they worth a jail term?

Under new laws appearing in Australia and the US, Internet pranks could well land hackers in very hot water, possibly even in jail. The penalties are among a raft of tough new security measures being put into place in the wake of the September attack on the US.

The laws include Australia's new Cybercrime Act 2001, which carries penalties of up to 10 years' jail for offences such as hacking and spreading viruses.

The Cybercrime Bill was introduced in July, but was only agreed to after September's terrorist attacks. The US is also considering an anti-terrorist bill — in direct response to the September tragedy — which could classify certain computer crimes as terrorism. The maximum penalty under this proposed law is life in prison.

The laws coincide with new surveillance measures in Australia and the US, which give federal police the power to tap into emails and monitor telephone conversations of suspected criminals. Australia has been leading the way on the 'e-security' binge, setting up special Internet security groups and passing 'espionage' and 'interception' laws.

The new laws have raised many eyebrows across the Internet community, including Net activist and lawyer Kimberley Heitman. "This is one of the biggest dangers of what I consider to be a hysterical overreaction to the threat of terrorism. The danger is that relatively innocent behavior will be criminalised," Heitman said.

Such innocent behaviour could include things like office managers testing network security, or someone accidentally passing on an Internet virus.

"It seems the exclusions for potentially legitimate activity are very narrow," Gilbert & Tobin Internet and copyright lawyer Michael Williams said. He predicts that prosecutors may find their hands full with people challenging the new law.

Adding to the confusion is the variety of state and territory laws that already apply to hacking. There is also the question of whether Australians would be subject to tough jail terms under the US' proposed law.

There's no doubt hacking has turned into a legal minefield. The Internet community is certainly crying foul, with headlines such as "Hackers face life imprisonment under 'Anti-Terrorism' Act" seen online.

At the time of writing, the US' proposed anti-terrorist laws were being watered down and computer crimes only classified as terrorism if they were intended to "influence or affect" government.

William Maher

PHONE THE NET

Windows XP's new voice application allows broadband users to make phone calls using the PC and its Internet connection.

Taking instant messaging to the next level, Windows Messenger is integrated as part of XP, and will provide options for users to connect to registered carriers.

Telstra is believed to be in negotiations with Microsoft for voice over IP trials as part of the XP launch, although neither party could confirm details at the time of writing.

A four month voice over IP trial is slated to start with the launch of Windows XP this month, before the service is opened up to the public.

"You can make phone calls at the moment [using MSN Messenger] but there is no security or reliability," said Harvey Sanchez, regional wireless and mobility manager at Microsoft Australia.

"By having carriers registered as part of the service, customers can be sure there won't be the kind of jerkiness and delays typically associated with making calls over the Internet," Sanchez said.

Business models and pricing are yet to be determined, but Sanchez said it is likely only broadband subscribers will be offered the service.

"It will take about 12 months to figure out the commercial packages, but the performance of voice and data is too poor to offer it to narrowband subscribers."

Garth Montgomery

EMAIL SMS

THE MAIL SERVER AT WORK IS GOING TRULY MOBILE AND AVAILABLE ANY TIME.

The next mobile phone text message you receive could be from your mail server at work, as SMS shows its first signs of maturity.

Person-to-person SMS is a phenomenon that caught most by surprise. While phone makers and carriers pushed the Web-on-a-phone concept with WAP, mobile phone users were quietly discovering the joys of pecking short text messages to one another.

More than 2 million messages a day are estimated to be sent through Telstra's network, compared with 1,000 a day between August 98 and 99.

However, consumer SMS growth can't continue indefinitely, and carriers are now deploying services that allow mobile users to have their mail, calendar and contact details sent from their PC at work to their mobile phone.

Microsoft is currently rounding off trials of Mobile Information Server (MIS) software, which allows the Exchange mail server to text message Outlook functions.

I'm shopping and working — it's my digital lifestyle.

"We believe that machine-generated SMS will provide carriers with the growth they need to sustain their own data business, which at the moment almost solely relies on text messaging," said Harvey Sanchez, regional wireless and mobility manager at Microsoft Australia.

Telstra plans to offer the service to businesses from November, after trials with Merril Lynch and the South Australian government proved successful.

Vodafone will continue to integrate MIS with its own SMS gateways and billing system, and expects to be ready in December.

Garth Montgomery

FUNNY MONEY

The late 1990s were one wild party for tech stocks, but now the message for struggling startups seems to be: 'no more mischief, you are being watched'.

Authorities are cracking down on the tricks that helped tech companies fleece millions of dollars from hapless investors before the stock crash of April 2000. In Australia, investment watchdog ASIC has picked out 100 companies and is watching for signs of bad behaviour.

Dot conning gets harder.

Just who's on the list is a mystery. ASIC won't discuss names, except to say the companies were picked at random. The aim is to make sure no-one plays games with their profit and loss reports. "If we've got some results that are really bad, then we'll talk [about names]," said chief accountant, Ian Mackintosh.

Companies aren't allowed to lie when telling the world about their profits and losses, but they are sometimes able to be misleading. During the late 1990s a popular trick was to hide huge losses behind a wall of jargon.

Instead of profits, companies reported 'pro forma' earnings, which can ignore all sorts of major expenses. A company might report restructuring charges when what they really meant was 'we're laying people off'. Some companies even adjusted profits for 'stock-based compensation'. In other words, their share price hit the floor.

Are Australian companies using spin to make the bankbook seem a little fatter? "We've seen problems like that, particularly with high technology companies. An example is revenue recognition, where companies are taking up revenue before they've earned it," Mackintosh said.

Investors might be taking the hype from tech companies with more than a few grains of salt, but still ASIC isn't taking any chances. This year there are new rules for how companies report profit and losses.

William Maher

KEEPING UP WITH THE JONESES

As if it wasn't already hard enough to keep up with the constant flood of new PC chips, things are about to get even more complicated. AMD will begin naming its Athlon chip using special model numbers, rather than raw speed (GHz). For example, a 1.5GHz Athlon will be called the Athlon 1800+.

The move isn't surprising because AMD has been pointing out for some time that clock speed isn't everything when it comes to chip performance. In some tests, an AMD chip with a slower MHz rating can actually outperform a 'faster' Pentium chip from Intel.

Chip off the new block.

NAME DROPPING

The regulatory body in charge of the .au domain space, auDA, says it will consider new domain names next year. Possible changes include geographic domains (such as bathurst.nsw.au) for local communities, finally ending the ban on place names in the .au space. Also on the cards is a domain for personal Web pages using .id.au, which has been held back by requiring an annoying subdomain (such as dropbear.id.au). auDa says it wants to give consumers more choice. (Ideas to **comments@auda.org.au.**)

LESS EXCITING

Broadband provider Excite@Home Australia has been rescued by Optus after US joint venture partner Excite@Home went bankrupt in spectacular style. Optus has swallowed Excite@Home Australia's entire high-speed network, 40,000 subscribers and the excite.com.au portal into its Consumer and Multimedia Division. "Customers won't notice any change to services," an Optus spokesperson promised . . . for now.

STAYING IN STYLE

China-white walls with a contrasting graphite carpet, illuminated by strategic backlighting. No, it's not the inside of a Versace store, it's the new way of selling computers. AppleCentres around Australia are undergoing a major face-lift to take computer shopping upmarket. Lifestyle imagery accompanies special sections like 'iPods' for portable gear and 'Gondolas' for high-end desktops. The idea is to 'hero' the Mac compared to the production line approach of PC retailers.

HE SAID WHAT?

A 20-year-old in the US has come up with a novel approach to dealing with news stories he doesn't like — rewrite them. Adrian Lamo decided to make some creative changes to the Yahoo News site when he rewrote that a Russian programmer arrested for copyright charges was now facing the death penalty. After three weeks of similar mischief, SecurityFocus.com alerted Yahoo to the hole and they promptly patched it. The Russian was happiest of all.

COMPAQ FEELS HEAT

Things aren't at all rosy for Compaq. Still recovering from massive job cuts in the wake of its mega-merger with Hewlett-Packard, the PC seller has slashed third-quarter revenue forecasts by 12%. Partial blame has been laid on — you guessed it — September's terrorist attack, which caused Compaq to lose a week's worth of business during a peak sale period.

Lining up for redundancy?

TYPECAST
BY A TYPEFACE

OLD FASHIONED, NERDY, SEXY, OR JUST A WUSS? A MILESTONE STUDY SHOWS YOUR PERSONALITY BASED ON TYPEFACE.

If you were a font, what would you be? No, we've never given it much thought either. But printer-maker Lexmark thought it was a profound enough question to commission Manhattan psychologist, Dr Aric Sigman, to conduct a study to reveal what your preferred font says about you.

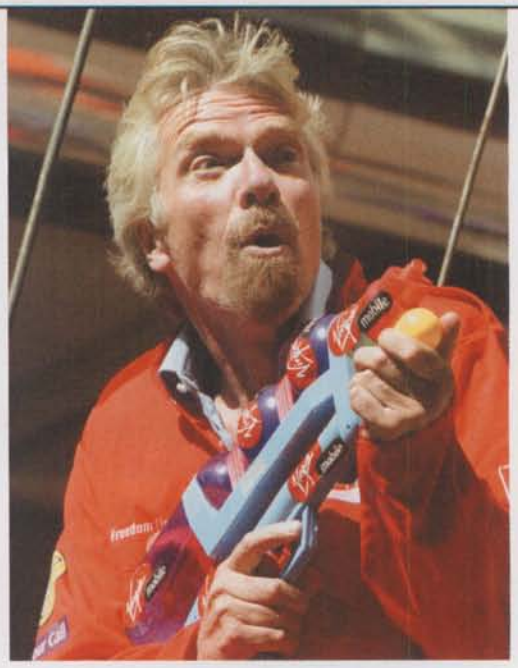
The study, titled 'The Psychology of Fonts', proffers that a preference for vanilla-flavoured fonts, such as Courier, indicate you are "nerdy". Curvy fonts say sex kitten, Sans Serif is for cowards and Comic Sans says you're attention starved.

To ensure that we fully understand the psychological attributes of each font, Dr Sigman illustrates his weighty theorem using celebrities.

Renaissance artist J-Lo is a Shelley font, because she's sexy. Richard Branson is Verdana because he's "professional yet appealing". While the "sexually ambiguous" Ricky Martin is pure Palatino.

But Dr Sigman's insight into fonts doesn't end with typeface. The probing study pulls no punches in cracking the tough issue of whether font size really does matter. His research concluded that it most definitely does. When writing an important letter, Dr Sigman advises that small type is more powerful, while large type reveals insecurities.

Garth Montgomery



Richard Branson: Professional Virgin

KNOW YOUR FONT

Verdana traditional and professional, yet appealing; for example Richard Branson.

Courier favoured by librarians and data entry companies. Nerdy.

Shelley soft and curvy fonts favoured by 'sex kittens' such as J-Lo.

Sans Serif you tend to value your safety and anonymity.

Palatino sexually ambiguous — Ricky Martin, perhaps?

Source: The Psychology of Fonts

AMERICA'S ONLINE GRIEF

If US talk show television is any indication, then grieving Americans can be scary enough without a tragedy the size of 11 September to unify the warm and fuzzies.

The nation's online punters took less than a day to register a slew of domain names related to the terrorist attack. Some sites are already live with active content as a tribute to the people and events of the day — with all its horrible tales. Others remain under construction or simply cybersquatted for who knows what reason.

Osama's new proctologist

There are the pure information sites such as September112001.com and americaunderattack.com. Other gems registered include: OsamaSucks.com, BinLadenBlows.com, HijackThis.com, BringMeTheHeadOfOsamaBinLaden.com, and BushVsBinLaden.com.

But best of all is **OsamaYoMama.com**, which sports some humorously doctored pictures and the tagline; "Osama, Yo' Mama is so frail, she can hang glide off a Dorito!".

Garth Montgomery

BRO33324/P/APC

The HL-1600 Series business printers.
Reliable. Value for money.
What label would you put on them?

Brother laser printers are also called fast, network capable, high quality, feature heavy and hard working. And if you purchase one between now and November 30, we'll give you a free Brother P-Touch PT-1100 labeller so you can get the office sorted out at the same time as your printing. Call us now or talk to your nearest Brother reseller.

At your side.

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***Participating resellers only. Offer valid from October 1 to November 30, 2001. Model PT-1100 RRP value $99.00 including GST**

ALL THE BELLS AND WHISTLES

UNIVERSAL DISAPPROVAL OF SONY'S PROPRIETARY MEMORY STICK TECHNOLOGY MAY WELL SINK THIS NEATLY ARRANGED AND WELL-APPOINTED TITANIC OF THE DIGITAL CAMERA WORLD. ALL ITS BELLS AND WHISTLES WON'T BE ABLE TO SAVE IT IF THE CONSUMING PUBLIC REJECTS THE MEMORYSTICK. *By Simon Tsang*

It's the same sequence of reactions every time. First the 'oohs' and 'aahs' as the beholder reaches out to touch the camera, as if its existence in this world can only be established through tactile feedback. Next comes the incredulous 'five megapixels you say?', followed on cue by 'and it records movies as well? How much memory does it have?'. The usual response, '16Mb', then a pause for maximum effect, '. . . on Memory Stick'. 'Oh, yuck!' would be one of the less profane reactions, suitable for a family-friendly magazine such as this. But all words uttered at this point are the same in sentiment. Universal disapproval of Sony's Memory Stick. Not because it's a bad technology: on the

Sony Cyber-shot DSCF707

contrary, it works exceptionally well, and most people actually like the stick-of-gum form factor. And you can use it everywhere — so long as it's on a Sony product. Therein, of course, lies the problem.

Sony's insistence on its own proprietary flash memory format is quite baffling considering its experiences with the Betamax/VHS wars (no prize for guessing the loser on that one). It's never been about superior technology; rather cross-brand compatibility. Consumers love choice, and generally stay away from products that don't let you share media with devices from other manufacturers. Plain and simple. The outcome of the flash memory 'standard' will almost certainly not be in Sony's favour, with a strong swell of support for Secure Digital (SD) coming from a consortium of electronics and computer manufacturers.

Sony Cyber-shot DSCF707
Online www.sony.com.au
Phone 1300 137 669
Price $2,999
Verdict ▮▮▮▮

This is rather unfortunate, especially in the case of Sony's new Cyber-shot DSCF707, as there is a very competent camera behind the compatibility issues. Based on the opinion-polarising L-shaped design first released as the DSCF505 a couple of years ago, the F707's emphasis is right where it should be in a camera — the lens. With the quality Carl Zeiss lens barrel making up the bulk of the camera's weight and size, the F707 demands both hands for operation. Happy snappers need not apply. The body is anchored to the lens barrel on its left using a single pivot point which allows it to rotate through a sweep of 113° — a handy design for above-the-head or low-angle shots.

The location of the controls makes this camera exceptionally easy to handle.

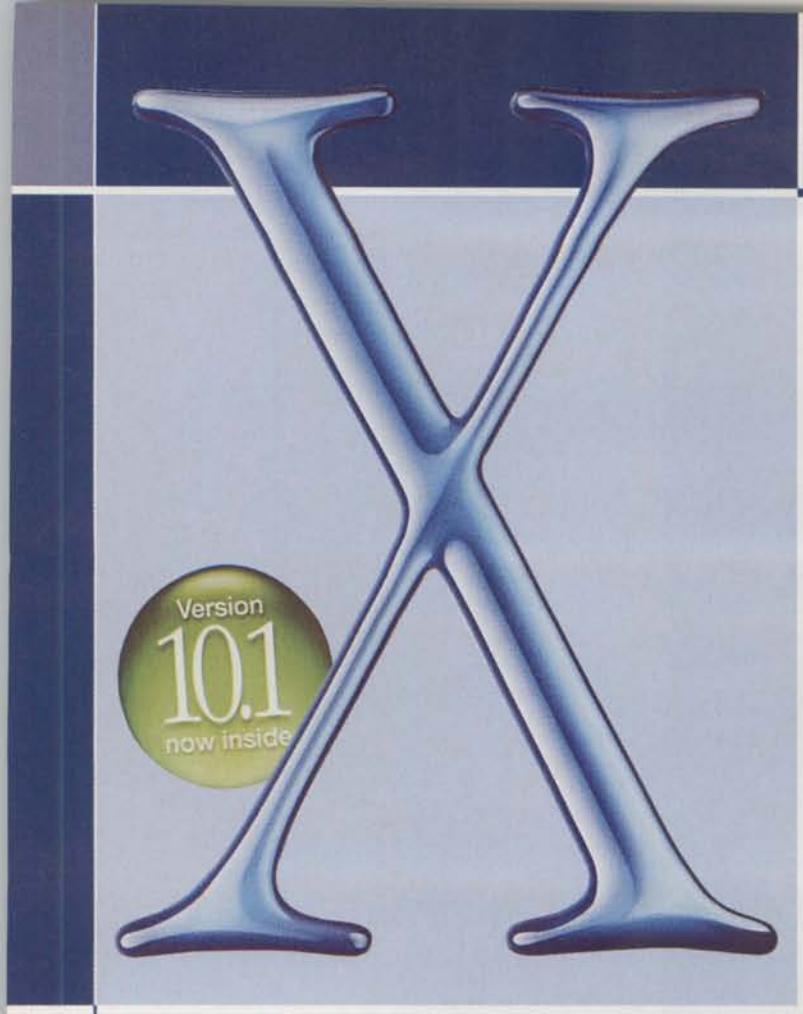
The 10x zoom capability is divided equally between optical and digital. The latter can be switched off via the onscreen menu. Even without the digital zoom, the optical component is impressive when you consider that it's equivalent to a 38-190mm lens on a 35mm still camera. The macro mode is also very functional — far better than most digital cameras on the market. Its claim that it can take pictures as close as 2cm from the subject in macro mode isn't exaggerated.

The large lens barrel is also good for accommodating many of the controls, and Sony has made full use of this real estate by populating the left side of the cylinder (where your left thumb nestles) with the zoom, manual focus, exposure lock, white balance and metering mode buttons. The pop-up flash is built into the top of the lens housing just in front of the accessory shoe for external attachments. This mounting bracket is not to be confused with the standard hot shoe for external flash units found on most professional cameras, as Sony has once again gone proprietary in this department. The accessory shoe doesn't have any contacts within, but relies on an adjacent jack to make its connection to optional flash units or remote-control tripods. Otherwise, the location of the controls make the DSCF707 exceptionally easy to handle.

One notable improvement over its predecessor, the F505, is that there is now an LCD viewfinder in addition to the 46mm LCD screen. This overcomes the previous model's shortcoming of not being able to use the screen in bright sunlight. At the opposite end of the lighting spectrum, a Nightshot mode allows for compositions in the dark using infra-red sensors. It acts almost like night vision goggles, letting you see through blackness that the naked eye can't. Very cool indeed.

The F707 is also great for recording small MPEG movies, with two resolution options — 320 by 240 and 160 by 112 — and a high-quality mode running at 16fps for the larger resolution. Still images can be recorded at a maximum of 2,560 by 1,920 thanks to its 5.24-megapixel CCD array. Full manual adjustments for shutter speed, aperture, focus and its three flash intensity settings mean that the F707 offers great control and flexibility for those wanting to get a little creative. For this purpose, the battery life of the rechargable lithium ion pack is also commendably lengthy.

There's much to appreciate about the F707 and the way that it just simply works. If you don't mind overcoming the proprietary Memory Stick storage by either buying other Sony equipment, which of course isn't entirely practical, or by getting a Memory Stick reader/adaptor, which means added expense, then there's a very interesting and unique camera for the taking here. ■



SECOND BITE OF THE OS

MAC OS X VERSION 10.1 IS MEANT TO TAKE APPLE'S GROUND-BREAKING AND STYLISH NEW OS INTO THE MAINSTREAM. BUT EVEN AFTER A MAJOR UPDATE, DOES OS X HAVE ENOUGH SUBSTANCE (AND STABILITY) TO MAKE IT IN THE REAL WORLD? *By Fiona Angus*

It's been six months since Apple let loose a completely new operating system on the Mac universe. Remember how stunning the visual effects and speed of OS X first seemed — just before you discovered how hard it made basic tasks like playing a DVD? Now on its all-important first major update, Apple says it's fixed those annoying holes. Yet is OS X really ready to go mainstream?

Apple has timed the release of version 10.1 to guzump the launch of Windows XP. Sure, Microsoft's new OS might look like a down-market copy of Apple's Aqua interface, but then Windows never suffered the compatibility problems of OS X. Mac users are over the gee-whiz stage and want those nitty gritty details that get through everyday tasks. There have been five minor updates since OS X was released in March, and it's been a rocky road to remake the Mac platform from scratch.

▶ *Burn CDs straight from the desktop (almost like that old floppy).*

This latest update is meant to make converting to Apple's next-generation operating system not only tempting, but workable. With more speed, stability and support, 10.1 can hold its own in the real world and even comes with a few nice surprises.

Upgrading from OS X or installing for the first time is a simple 30-minute walkthrough. You're immediately struck by the fluid operation of the desktop and speedier menu handling. OS X has always been fast, but in 10.1 windows resize smoothly and there's less stalling and skipping.

Launching applications is also faster. On average, 10.1 shaves 30% off launch times compared to OS X. However, inside applications there is very little difference.

After speed, the coolest feature of version 10.1 is Apple's new method of burning CDs. Just copy files to a blank CD, drag the disc into the trash, select burn, and presto — your documents and photos are safely stored. It's as easy as using a floppy and also works for DVDs if you're lucky enough

▼ *Play DVDs with Apple's classy new player.*

PERFORMANCE

Shave a cool 30% off launch times	OS X	OS 10.1
Start up	1 min 46 secs	1 min 28 secs
FreeHand 10 for OS X	12 secs	9 secs
Office Mac:2001 for OS 9	5 secs	3 secs

How we tested:
400MHz PowerBook G4 with 128Mb of RAM and a 10Gb hard drive
FreeHand 10 opening a 264Kb file
Office Mac:2001 for OS 9 opening a 6.2Mb word file

Build your own toolbars.

to have a SuperDrive. You also finally get to play DVDs in 10.1 with the new DVD player, and the elegant silver control panel won't steal the limelight from your movies.

Apple has been reluctant to change the look of the Aqua interface, but you can rearrange it a little in 10.1. Shift the Dock to the left or right of screen and control open applications through a special pop-up menu attached to each icon in the Dock. You can also create your own toolbars in the main desktop (Finder) window.

Macs have always been notoriously difficult to network with PCs, and unfortunately, OS X continues this tradition. Apple insists that 10.1 makes it simple to link your Mac to a Windows network, but despite some long and tedious searches, we couldn't get it to automatically detect Windows machines. Luckily for us, Apple has reintroduced support for the old (but reliable) AppleTalk protocol.

Until now, you also weren't able to use most peripherals with OS X. Every plug-and-play device we tried (including an Epson printer, an IBM memory key, an Imation 30Gb FireWire disk, a Creative MP3 player and even a Microsoft mouse) all worked like magic in 10.1. It still drew a blank on our Canon and Ricoh digital cameras, which was a shame since 10.1 has a handy digital photo manager that downloads images straight from a camera.

OS X is growing up and making its way in the real world, but it has yet to reach maturity. After all, Apple still uses OS 9 as the default OS on new Macs and gives you the still-too-new OS X preloaded as a (tempting) extra. ■

PRICING

Apple won't make the upgrade available as a download because, at over 600Mb, it's just too big. But if you walk into an AppleCentre before October 31 with your OS X proof-of-purchase, OS X version 10.1 is free! After that, it costs $19.95 (the same price as on **www.apple.com.au**). The entire OS X version 10.1 package costs $229.

Verdict ▮▮▮▮

THE WORD IS OUT

Test drive Word on this month's CD1.

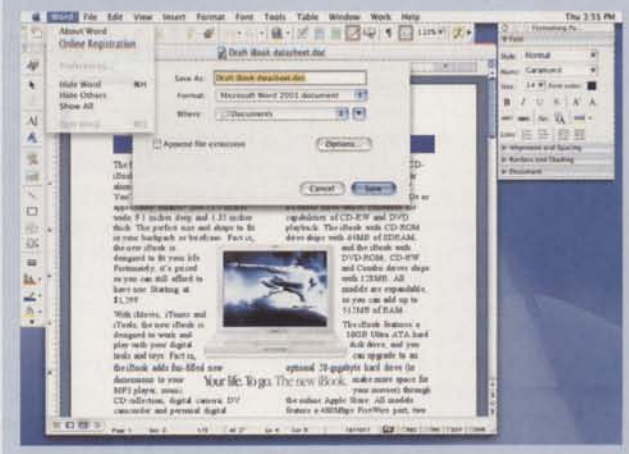
You've never seen a Word file look this good. Microsoft will release the full version of Office 10 for OS X in Australia by early December, but if you're using OS X version 10.1, you can download a special preview of Word X until 1 January.

From what we've seen, Office 10 has embraced all the style and rich visuals of Aqua. Using Apple's Quartz 2D graphics rendering, every document looks like a polished PDF file. Word X rejuvenates the staid word processing experience, and flowing formatting palettes also help the creative juices. Otherwise, Office 10 doesn't boast many new features. PowerPoint has a QuickTime Movies feature that packs extra animation into presentations, while Excel has a few more keyboard shortcuts and an auto-recover function — hardly revolutionary stuff.

Yet with Office now firmly established in OS X, it's safer and easier to make the move from OS 9. The big-name software developers have been waiting for Apple to release the first major upgrade to OS X and stamp out a few bugs. Apple claims there are 1,400 applications available for OS X, and that number has really started to snowball since September.

Adobe Illustrator 10 is ready for OS X, while GoLive and InDesign are also making an appearance. Others to join the honour roll include Connectix's Virtual PC for Mac OS X, Corel Graphics Suite 10, Toast Titanium, AOL Instant Messenger and MSN Messenger 2.0, as well as Opera beta and Netscape 6.1 (OS 10.1 comes with Internet Explorer 5.1).

Apple insists it will take a full year before the majority of software developers make the transition to OS X. Essentials like Dreamweaver and PhotoShop (which should really fly under OS X) are the missing links for making OS X completely irresistible.



Word has never looked this good!

NOT JUST A PRETTY FACE

TODAY'S MACS ALL RATE HIGHLY IN THE GOOD-LOOKS STAKES. COULD THIS BE THE ONE THAT PERFORMS WELL TOO? *By Simon Tsang*

Invariably, when a Mac gets reviewed in a traditionally PC-based magazine, the focus becomes its performance compared to a similarly priced or specified PC. And invariably, it finishes second best, simply because, on a grunt-for-dollar basis, a Mac cannot compete with an open platform system. However, that's like saying a Mac isn't as good because it's not a Wintel PC. And that, of course, is far from the truth.

So let's just get it out of the way by saying that yes, the new dual processor G4 is an expensive piece of hardware. Combined with the 17in Apple Studio Display, the kit comes at little short of 10 grand. However, we are talking about the flagship Power Mac G4 with a stunning flat panel LCD screen. I would try to compare it to an equivalent PC, but I don't think there is such a thing. Existing Mac users will know what I'm talking about. Windows PC users read on.

For a start, the Power Mac's styling is captivating enough for most people. Looking beyond the mouth-watering crystal/silver finish (Quicksilver), the box is also extremely practical and the entire motherboard and riser card assembly folds out at the release of a single lever. This reveals four spare PCI slots for expansion cards, as well as an AirPort Card connector that allows you to just plug in the $199 option for wireless networking.

The dual processor setup means the G4 draws from a total of 512Kb of L2 cache running at the same speed as the CPUs, and 4Mb of L3 cache running at a quarter of the processor frequency. The CPUs are two 800MHz PowerPC G4 processors fitted with the 128-bit Velocity Engine, so they pack substantial grunt. The real crowd-pleaser, however, is the SuperDrive, a combination drive that can burn both CDs and DVDs in the one spindle.

SuperDrive-equipped models also come with the excellent iDVD software package that makes authoring your own DVD movies ridiculously easy. This includes building your own navigation menus and indexes. The price of the G4 is thus put into context, considering that the SuperDrive is an Apple OEM version of the Pioneer DVR-A03 burner (see page 30) and costs $1,595 on its own. With two built-in FireWire ports and iDVD integration, the Power Mac G4 is the ultimate DV-editing desktop machine.

The round eye-like object at the front of the case isn't a camera, but an exposed speaker cone. The design defies all logic, as the potential to damage it is quite high. Even the user manual warns that this is a fragile element and not to stick anything in it. Better to shield it with something and sacrifice the 'optimal sound fidelity' than to risk someone poking it out.

The Apple Studio Display, on the other hand, is an absolute thing of beauty. It's a flat panel that's hard to fault, connecting to a 64Mb nVidia GeForce2 MX graphics card with Twin View that supports both a standard analog VGA output and an Apple Display Connector, which combines the USB, power and digital monitor signals in a single cord and connector. There are two USB ports in the back, as well as the keyboard and box-mounted connectors.

The dual processor Power Mac G4 is an outstandingly integrated package, and a Mac that finally performs as well as it looks. ■

Apple Power Mac G4
Contact Apple
Phone 13 36 22
Online www.apple.com.au
Price $9,998
Verdict ▮▮▮▮▮

I can...

Reduced operating costs.
A Super Economy mode vastly improves operating economy without the definition sacrifices common to so many draft modes. It effectively quadruples output from both the black and colour cartridges.[1]

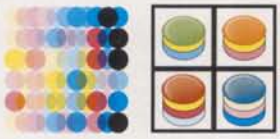
...fit even the tightest budget.

Brilliant plain paper photo quality, automatically.
A selectable function called Photo Optimiser is included in the printer control software. It automatically adjusts for defects in exposure, highlights and shadows, and prints accordingly with standard inks designed to optimise quality on low-cost plain paper.

Before.

After.

Superior photographic reproduction.
The optional PhotoRealism™ cartridge is ideal for high resolution papers. Low-density inks vary colour saturation per dot to dramatically increase the colour combinations, reduce grain and smooth tones.



PhotoRealism produces colours between colours.

BJC™-1000SP
colour Bubble Jet™ printer

Just $129[RRP]

High quality blacks at high speed.
The optional high capacity black ink cartridge uses 64 print nozzles for high print speeds. The selectable text smoothing mode goes up to 720 dpi to maximise text quality.

Optional BC-03 black ink cartridge.

Better Internet images.
Image Optimiser, a printer control software feature, automatically "corrects" low-resolution images up to the printer's maximum resolution.

3-YEAR WARRANTY OPTION

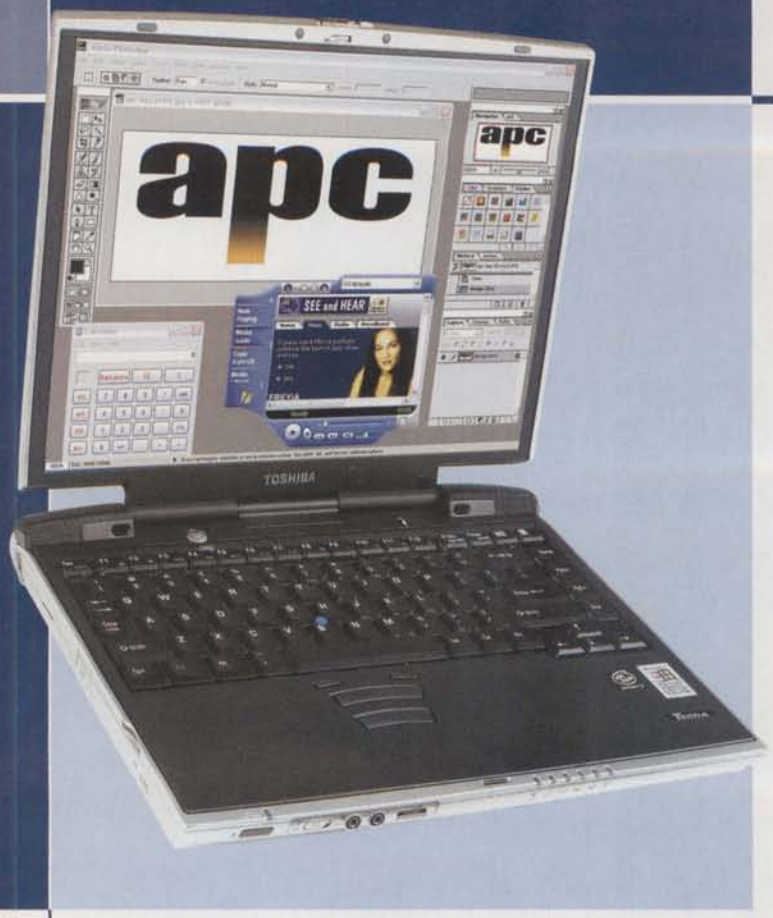
Canon Customer Care.
The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

You can...

Canon

Price shown is recommended retail price including GST. Canon® and the Canon logo are registered trademarks, and Bubble Jet, BJC and PhotoRealism are trademarks of Canon Inc. 1. Capacity for colour based on A4 pages at 7.5% coverage. Capacity for black & white based on A4 pages at 5% coverage per page. Specifications are subject to change without notice. Canon Australia Pty Ltd ABN 66 005 002 951.

CS0667/1



MASTER OF THE WAVE

IF THERE'S A WAVE OF NEXT-GENERATION NOTEBOOKS YET TO HIT THE PC SHORES, TOSHIBA WILL BE RIGHT AT THE CREST OF IT, PADDLING ITS LITTLE HEART OUT. *By Simon Tsang*

The recent release of the Tecra 9000 and Portege 4000 represents not only a change in design philosophy for Toshiba, it's also a sign of what's to come for portable computing in general.

The Tecra is not the first notebook we've seen that features Intel's new Pentium III-M 'Tualatin' processor and built-in 802.11b wireless LAN. In our September issue we looked at IBM's ThinkPad T23, which matched this specification — in fact, it had a faster 1.13GHz processor than the 1.07GHz (1,066MHz) unit in the Tecra. However, the Tecra 9000 can still be considered at the forefront of notebook design as it also incorporates Bluetooth technology and a Secure Digital (SD) card reader that Toshiba is touting as the successor to the floppy disk.

In past incarnations, it was possible to distinguish between the Tecra and Portege models at a glance. The Portege was an ultra-slim design with no built-in drives, and the Tecra was a corporate grey box that wouldn't have earned a second glance. The latest look, however, leaves you wondering whether they aren't twins that were separated at birth. Visually, there's not much to differentiate the two. Specifications, however, are another story.

For starters, it's hard to miss the Tecra's 14.1in TFT screen that natively supports an unusually large 1,400 by 1,050 desktop resolution, aided by the beefy 16Mb S3 SuperSavage/IX graphics chipset. Although handy for viewing long documents and multiple windows, icons and fonts must be very large to be clearly seen.

The Tecra also has more connectivity than the Portege, including serial, parallel, PS/2 and i.LINK (FireWire) ports on the back panel. A TV-out port is also provided, which can come in handy for presentations on TVs or just outputting a DVD movie.

Running on Intel's Pentium III-M processor, the Tecra's performance is great, and, even more importantly for a notebook, the Pentium III-M was designed with power consumption in mind (for full details of the PIII-M processor, see September *APC*, page 24). Intel's SpeedStep technology is still the main form of switching between running on battery or mains, but Toshiba has augmented this with its own power management utility that lets you easily toggle between five preset modes specific to the task that you're performing on the Tecra. This includes a mode for presentations that dims the display for you, and another for DVD playback. The result is an amazing three minutes and 27 seconds of battery power when running in battery-optimised mode.

Weight has also been the subject of much consideration, with Toshiba employing water-cooling technology to keep temperatures down on the inside. On the outside, however, the base of the notebook gets pretty warm if it's sitting on your lap, and the exhaust port at the right-hand side can double as a heater during the winter months.

With a combination CD-burner/DVD drive, 256Mb of RAM, 30Gb hard drive, internal modem and RJ45 LAN jack, the Tecra 9000 is as powerful and well-connected as a portable computer gets. ■

Toshiba Tecra
Contact Toshiba
Phone 1800 021 100
Online www.toshiba.com.au
Price $8,432
Verdict ▮▮▮▮▮

I can...

Exceptional results, easily.
The inks are optimised for plain paper. Quality can be automatically enhanced with Drop Modulation Technology™ with variable drop sizes. These are placed in any of five combinations to smooth colour gradations and improve tonal quality.

...get exceptional quality, very affordably.

Better internet images, special effects.
Image Optimiser can automatically "correct" low-resolution Internet images up to the printer's maximum resolution. Turn photos into simulated illustrations and create sepia hues, print banners up to 6 A4 pages long, overheads and even T-shirt transfers.

Duplexing, high speed blacks.
The driver allows manual duplex. For B&W only, an optional dedicated black ink cartridge with 128 print nozzles offers print speeds up to 5 pages per minute.[1]

Reduced operating costs.
Super Economy mode improves operating economy without the definition sacrifices common to many draft modes. It effectively quadruples output from both the black and colour cartridges.[3]

5 times the colour.
Optional PhotoRealism™ inks vary the saturation per dot. This produces up to five times as many colour combinations as conventional CMYK inks for better half-tones and less grain.

PhotoRealism produces colours between colours.

Built-in parallel and USB interfaces for Windows and Mac.[2]

Optional scanner cartridge captures colour photos with resolutions up to 360 dpi.

Automatic Image Improvement.
Advanced colour routines help define half-tones. Photo Optimiser automatically adjusts for defects in exposure, highlights and shadows and prints accordingly.

BJC™-2100SP

colour Bubble Jet™ printer

Just $169[RRP]

Canon Customer Care.
The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

3-YEAR WARRANTY OPTION

You can...

Canon

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Hello Neo . . .

Baby brother to Handspring's Visor Pro, the Neo packs the same fast chip, one-hand address book search and Springboard slot. What's different? A still-ample 8Mb of memory, and coloured peek-a-boo cases which collect fingerprints and smudges. However, at $449, the Neo will please students and first-time handheld users.

www.handspring.com.au

Visor Pro

NEW VISOR, OLD VISION

The Visor Pro ups the ante in the handheld stakes, and does so at a price that will have Palm worried — just don't expect any major breakthrough.

The Handspring formula gives the Pro a Springboard expansion slot, which accepts an array of plug-and-play modules ranging from memory and network cards to digital camera and MP3 players; fast USB sync to your Windows or Mac PC; and a tweaked Palm OS that includes the CityTime world time clock, a scientific calculator and improved DateBook. Unfortunately, it is based on Palm OS 3.5, not the recent 4.0 release.

The powerplant revs to the zippy 33MHz DragonBall VZ chip (also in the latest Palms) and sports the brilliant Fast Lookup introduced in the Visor Edge. You can look up address book entries with one hand, pressing the application and up/down buttons instead of using the stylus. After a little getting used to, it works like a treat.

The stand-out feature of the Visor Pro is a whopping 16Mb of memory — double that of any Palm handheld. This marks the Pro as power user turf. Most folk have difficulty filling even an 8Mb unit. It's only addicts of the AvantGo offline Web reader or chunky city guides such as Vindigo who will push their memory to the max. Even so, the RAM expansion capabilities of the Springboard module or SD card could mean a cheaper Handspring or Palm m125 is better value.

The dull silver patina of the Pro houses a rechargable lithium ion battery. While slightly smaller and lighter than the classic Palm III series, the Visor family (apart from the superslim Edge) remains chunky compared to the slimmer Palm V and 50x models.

David Flynn

Contact Handspring Australia
Phone (02) 9433 8380
Online www.handspring.com
Price $649
Verdict ▮▮▮▮

Card caddy

Once you've shelled out a few hundred dollars on MMC or SD cards for your Palm, you may as well pay another $40 to keep them safe and always at hand.

Microtech's MediaVault is a stylish, brushed aluminium case that holds four MMC/SD cards plus a notebook PC Card adaptor. Other models store Memory Stick, CompactFlash or SmartMedia cards in the same snug shock-absorbing design. If only it didn't tip over when you opened it, which spoils an otherwise very 007 effect.

www.conexus.com.au

Palm m125

CUTE AND WELL-CONNECTED

Palm's new m125 successfully melds the hip appeal and hip pocket-friendly price of the m10x series with the tech smarts of the slim m50x range.

From the m100/125 it inherits a compact shape and those funky swappable faceplates. From the m500/505 it gains an SD card slot which allows it to run applications and access data (such as ebooks and large files) from thumbnail-sized SD or MMC wafers, instead of occupying the resident 8Mb of RAM. We can also look forward to future SD devices such as a Bluetooth transceiver, MP3 player and GPS unit. The new Universal Serial Connector allows you to add extra hardware such as keyboards, modems and 802.11 modules.

The 33MHz DragonBall VZ processor has a lot of pep compared with the m10x's 16MHz EZ variant, especially when working with large apps or searching and sorting address book entries. The same high-contrast mono display panel as the m500's provides good readability outdoors.

The substantial software bundle leads with PalmOS4, Documents To Go and PocketMirror, for link-and-sync to Microsoft Office. There's also MGI PhotoSuite and Palm's ebook reader and mobile connectivity kit, with a standalone email applet.

Palm's use of the m50x docking cradle produces mixed results. Palm-to-PC setup is easier and synchronisation is faster, thanks to the USB link, but the m125 doesn't sit as neatly in the cradle as the m50x units, for which they was designed. Also, the fly-out power lead for recharging the m50x's battery could cause some confusion: don't go searching for the AC adaptor — it isn't included because the m125 uses standard AAA cells.

David Flynn

Contact Palm Australia
Phone 1300 360 558
Online www.palm.com.au
Price $589
Verdict ▮▮▮▮

I can...

The inks come in separately replaceable transparent ink tanks, and each is separate from the print head. The printer driver alerts you when inks are low allowing you to replace only one colour at a time, keeping operating costs down. Plus, Super Economy Mode saves you even more money by cutting ink consumption.

Light

Light

Smart monitoring system.

...print brilliantly, and save you money.

1440 dpi, variable ink drop sizes.
Quality is exceptional, even on low cost plain paper with resolution up to 1440 x 720 dpi, plus Drop Modulation Technology™ with variable ink drop sizes. B&W is enhanced using high optical density black pigment inks.

Better print quality, automatically.
Photo Optimiser adjusts for defects in exposure, highlights and shadows while Automatic Tone Control reduces the 'colour noise' from compact digital camera images. Image Optimiser prints low-resolution Internet images up to the maximum resolution supported by the printer.

Optional PhotoRealism.™
Special inks vary the saturation level per dot (e.g. 33%, 67%) for up to 5 times as many colour combinations as conventional CMYK inks. The result is smoother tones with vastly reduced grain.

PhotoRealism produces colours between colours.

Brilliant Colour Inks

4 ppm colour | 9 ppm mono

High speed printing.
Large print heads and bi-directional printing produce up to 4 colour pages per minute. An optional, dedicated black ink cartridge is capable of B&W speeds up to 9 pages per minute.[2]

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

3-YEAR WARRANTY OPTION

Parallel and USB interface. Both ports are built-in for Windows and Macintosh.[1]

USB

Turn your printer into a 720 dpi colour scanner with the optional scanner cartridge, pictured left.

S400SP

colour Bubble Jet™ printer

Just $259[RRP]

You can...

Canon

Price shown is recommended retail price including GST. Canon® is a registered trademark and Bubble Jet, Drop Modulation Technology and PhotoRealism are trademarks of Canon Inc. Microsoft®, Windows® and Windows NT® are registered trademarks of Microsoft Corporation in the US and other countries. Apple®, Macintosh®, Mac® and Mac® OS are registered trademarks of Apple Computer Inc in the US and other countries. All other trademarks are the property of their respective owners. 1. Printer driver support is provided for Windows® 95, Windows® 98, Windows® 2000, Windows® Me, Windows NT® 4.0 for the parallel port and pre-installed Windows® 98, Windows® 2000, Windows® Me and Mac® OS 8.1+ or 9.X using the USB port. 2. Print speeds may vary with the content of the document and the processing speed of the host computer. B&W print speeds require the optional BC-30e black cartridge. Specifications are subject to change without notice. Canon Australia Pty Ltd ABN 66 005 002 951. CS0662

Reborn PCI-2K card

Don't judge a piece of hardware by its size, or its price tag. The $99 Reborn card has the power of life and death over your PC. That is to say, it can bring your system back to life after an untimely demise. We tested the card by deliberately destroying 3Gb worth of data, and the Reborn card restored the lot within a single second on the first reboot.

Full review at **www.apcmag.com/ontest**

StarOffice shines on

Version 6 of Sun's freeware StarOffice suite hits the beta phase this month. Linux fans were wowed by a demo at last month's LinuxWorld Conference and Expo, praising StarOffice 6's improved speed and its move to XML-based file formats. The contentious StarOffice Desktop has been canned, and the applications now run individually rather than all loading at once. StarOffice 6 will run on Linux and Windows, but not on Mac OS.

www.sun.com/staroffice

Pioneer DVR-A03

DVD HEAVEN

If you want real optical storage, DVD is the way to go. Up until now, you either had to go for DVD-RAM (expensive and incompatible) or cough up tens of thousands of dollars for a DVD-R drive. As with all hardware, over time DVD-R is getting cheaper and more common. The first reasonably priced DVD-R drive we've seen is Pioneer's DVR-A03.

In theory, the DVR-A03 can't copy CSS-encrypted titles; at least, a direct DVD-ROM to DVD-R copy is unlikely to work. However, unwilling as I am to risk the wrath of Warners, Sony, et al, I will say that, despite these claims, it's not rocket science to copy a DVD. Mind you, at $30 to $40 per blank DVD it's hardly worth it.

Our testing was initially done on a 1.13GHz Athlon system with 128Mb of RAM. The drive is capable of 1x (1.38Mb/s) or 2x (2.76Mb/s), meaning that a full disc should be written in under 30 minutes. Figuring that a high-end drive deserves a high-end system, we also stuck it on a 2GHz Pentium 4 system with 128Mb of SDRAM. Copying a full 4.7Gb took 56 minutes and 35 seconds, which is quite a bit longer than the 2x, but it's still a lot of data archived in a very small period of time. Playback of DVD-R was flawless in every drive we tested. DVD-RW playback, on the other hand, was inconsistent in our test drives, but not surprisingly, went well in a Pioneer DVD player.

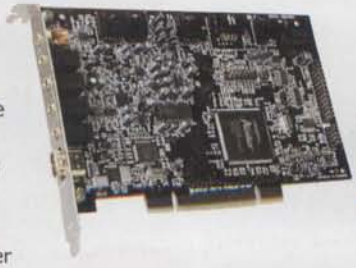
At $1,595 the A03 is a serious buy, but the price is a whole lot better than the $10,000 to $20,000 the previous generation sold for.

Alex Kidman

Contact Pioneer
Phone 1300 364 765
Online www.pioneeraus.com.au
Price $1,595
Verdict ▮▮▮▮

Creative SoundBlaster Audigy Platinum eX

AWESOME SOUND!



Whether you're into gaming, music, home digital audio production or just awesome sound, the SoundBlaster Audigy Platinum eX is the best card you can get.

It is powered by a new 32-bit Audigy sound processor, which is four times faster than the SoundBlaster Live's processor. It can process amazingly realistic 3D effects with up to four simultaneous audio environments, providing even greater realism with games that use EAX Advanced HD. Some of the 3D effects include sound spatialisation (enhanced sound placement), environment reflections (so you can actually hear the shots ricochet off the walls) and filtering to simulate indoor and outdoor environments. EAX Advanced HD is backwards compatible with EAX, so you can still enjoy games written for the Live card.

The Audigy card features 96KHz, 24-bit digital audio with a 100 decibel signal-to-noise ratio. This is top of the range, DVD-quality sound

The Audigy has some amazing real-time audio effects that enhance the sound of digital music, CDs and MP3s. These effects include reverb, noise reduction, click and crackle removal, time scaling (to speed up or slow down audio without affecting pitch or quality) and enhanced 3D surround sound.

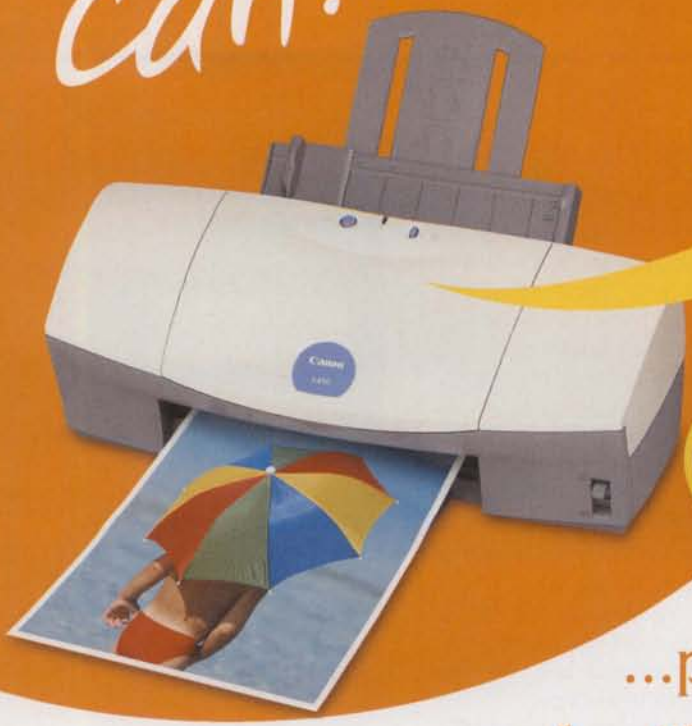
The Audigy Platinum cards include midi-ports so that you can connect a keyboard and take advantage of its Soundfont sampling technology. The Platinum eX also includes the external Audigy drive connector box with inputs and outputs for just about any digital, analog or FireWire device. There's even a wireless remote control!

The Platinum eX also comes with some outstanding software. Excellent value, awesome sound — definitely the one to get!

David Neiger

Contact Creative Labs
Phone (02) 9666 6100
Online www.creative.com
Price Platinum eX, $599; card only, $249; Platinum with internal drive bay, $499.
Verdict ▮▮▮▮▮

I can...



A smart ink monitoring system alerts users when a colour is running low. Individual transparent ink tanks for all colours are separate from the print heads, significantly reducing operating costs and allowing you to replace only the empty tank.

...print very fast in brilliant colour.

Introducing 6 absolutely brilliant colours.
The S450 uses Canon's new high optical density inks in either of two configurations for better, more vivid colours than ever before. The standard inks are optimised for superior plain paper quality, while the optional 6-colour PhotoRealism system is ideal for higher paper grades. Reproduction is amazingly life like with smooth tonal gradations, even in difficult to reproduce shades.

Brilliant Colour Inks

Separate ink tanks.

Better print quality automatically.
The printer control software helps you maximise print quality. Photo Optimiser adjusts for defects in exposure, lighting and colour while Automatic Tone Control reduces the colour noise often common to compact digital cameras. Image Optimiser prints low resolution Internet images up to the maximum resolution supported by the printer. All functions can be used in automatic mode.

Parallel and USB interface. Both ports are built-in for Windows and Macintosh.[2]

USB

Advanced print head system, fastest in its class.
Multi-nozzle dual print heads combine with bi-directional printing to deliver high volume ink output fast. This results in monochrome text speeds of up to 10 pages per minute, and colour printing up to 7 pages per minute, making the S450 the fastest printer in its class.[1]

7 ppm colour

10 ppm mono

S450
colour Bubble Jet™ printer

Just $329[RRP]

An optional scanner cartridge delivers resolutions up to 720 dpi.

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

3-YEAR WARRANTY OPTION

1440 dpi plus Drop Modulation Technology

1440 dpi, variable ink drop sizes, blacker black.
Quality is exceptional, even on low cost plain paper, with resolution up to 1440 x 720 dpi plus Drop Modulation Technology™ variable ink drop sizes. B&W correspondence is enhanced even further thanks to new, high optical density black pigment inks for superior print quality.

You can...

Canon

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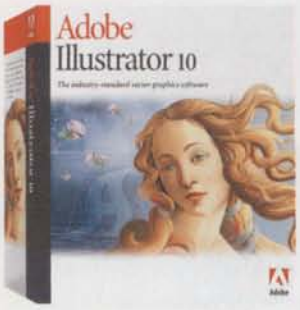
CS0660

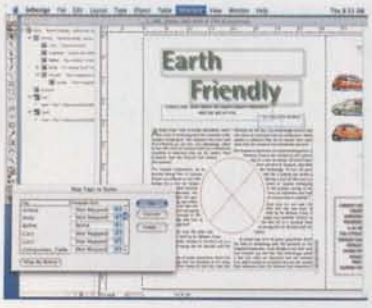
Mix and match

Why confine your craftily designed pages to paper? Adobe has placed cross-media support at the heart of the latest version of its vector and Web graphics publishing package, Adobe Illustrator. The landmark version 10 makes it easier to simultaneously design for the Web and paper, without skimping on the sophisticated image transformations. There's better management for repeat graphics and new support for symbols helps keep file sizes small, so Web designers don't have to stifle their creative instincts.



Snuggle up

Adobe InDesign 2.0 now performs complex multimedia tasks previously reserved for Photoshop experts using professional packages. It's the first layout program to support transparent Photoshop files, and you can now apply and edit drop shadows, and pull off cool feathering and opaque effects simultaneously. You have more control over tricky tables and long documents, a better print manager, and more support for XML.



Pinnacle Studio 7

ACCESSIBLE DV EDITING

There's never been a better time to get into desktop video editing. FireWire capture cards are under $150, there's ample PC power, and memory prices are at an all-time low. Now there's also Pinnacle's Studio 7 DV software suite.

Studio 7 offers an extensive range of titling, audio, graphics and transition effects and tools, as well as simple storyboard and more professional timeline editing interfaces. The capture-edit-output process is also remarkably easy to use.

We tested Studio 7 with several FireWire capture cards, and it worked first time, every time — a true rarity. FireWire makes it possible to control a DV camcorder from the desktop and effortlessly capture video to the PC's hard drive. The software also supports most analog USB video capture devices and PCI TV tuner cards.

As one hour of DV footage requires some 16Gb of hard disk space, Studio 7's SmartCapture feature is a blessing. It allows you to work with a reduced resolution 'preview' version of the DV footage, which needs as little as 380Mb per hour. Once the final edit is complete, Studio 7 imports the full-resolution footage from the camcorder to create the movie at full DV quality.

Movies can be saved in MPEG-1 or MPEG-2, Windows Media Format, RealVideo 8 and S-VCD.

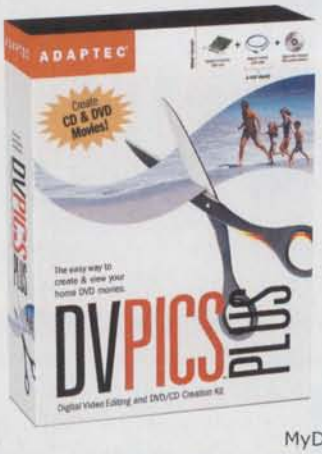
Studio 7's combination of creative elements and robust performance makes it the best video-editing software now available for under $400.

Peter Blasina

Contact Pineapplehead
Phone (03) 9852 7444
Online www.pineapplehead.com.au
Price $249
Verdict ▮▮▮▮▮

Adaptec DVpics Plus

HOLLYWOOD@HOME



Adaptec's DVpics Plus provides the fastest and easiest way yet to get movies from a DV camcorder into a PC, edit them, and then save the masterpiece to videotape, CD or DVD. It's not iMovie, but it's as close as any Windows PC is going to get.

The kit comprises a three-port Adaptec FireConnect 4300 FireWire card, a FireWire cable, MGI's VideoWave 4 SE DV editing software and Sonic Solutions' MyDVD software for CD and DVD authoring.

Setup is a dream: we dropped the FireWire board into a spare PCI slot and it was immediately recognised by Windows 98SE. As soon as the driver and VideoWave software was loaded, the PC was ready to start desktop video editing.

VideoWave SE is a simple editing application. It identifies a DV camcorder or VCR, and permits direct control of the DV camcorder from your PC. As the footage is transferred onto the PC, each scene is identified just as it's been recorded on the camcorder. The interface saves a thumbnail for each scene, so that all clips or 'assets' can be dragged and dropped onto a storyboard to assemble your movie.

There's a good range of transitions and filters, plus a basic titling and graphics application.

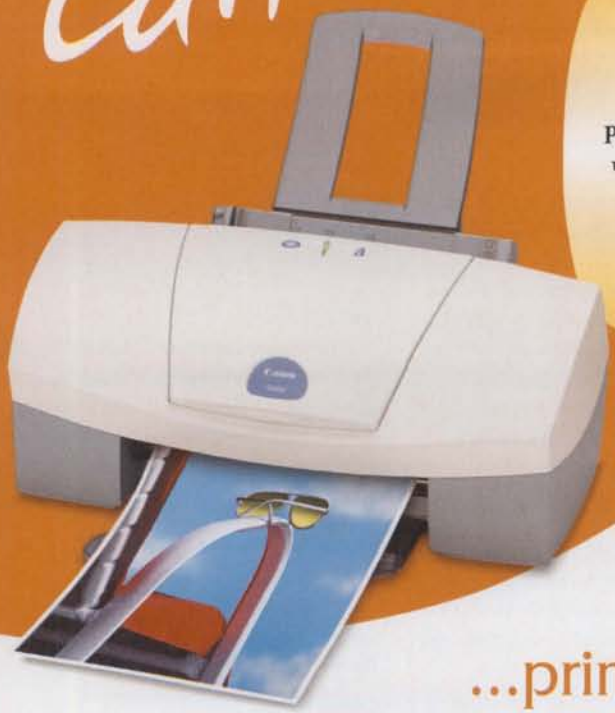
Finished movies can be saved as an AVI file and recorded back to DV tape, or as either MPEG-1 or MPEG-2 files for outputting to VCD or DVD.

MyDVD is an intuitive piece of software that provides a simple way to quickly burn home movies onto a DVD that can be played on a computer or in most standard DVD players. The best feature is the ability to use menus and build basic interactivity with the video to create a dynamic non-linear interface closer to what you'd see on a commercial DVD release.

Peter Blasina

Contact Adaptec
Phone 1300 654 534
Online www.adaptec.com
Price $169
Verdict ▮▮▮▮

I can...



Super fast, fast mode.
A special fast mode combines an extra large print head capable of up to 12 million ink ejections per second with four drive motors. The paper feed is up to 70% faster, and is enhanced by a 20% greater data compression ratio. This allows fast mode to print up to 15 monochrome pages (text), and up to 10 colour pages per minute.[1]

...print up to 15 B&W pages per minute.

5 pico-litre drops for 2400 dpi.
The S600 uses MicroFine Droplet Technology to precision-place extraordinarily small ink drops at resolutions up to 2400 x 1200 dpi.

Better colours that last longer.
The S600 inks produce more vivid colours for improved reproduction on plain paper, and deliver sharper, blacker rendering of monochrome text. The ink range also offers vastly improved light fastness. In a simulated fading test, they have been shown to last up to 25 years using ISO standards for levels of acceptable fading when printed on Canon Photo Paper Pro.[2]

Smart ink monitoring.
Inks are contained in separately replaceable transparent ink tanks, and each is separate from the print head. The monitoring system alerts you when they are low, so you replace only one colour at a time.

Original print *S600* *Conventional*

Image simulation

S600
colour Bubble Jet™ printer
Just $599[RRP]

Parallel and USB interfaces are built-in for Windows and Macintosh.[3]

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

Resolves speed vs. quality issues.
The S600 also features a special draft mode. Slightly slower than fast mode, it combines high speed, with ink conservation, while resolving the quality issue common to conventional draft modes. New head design and Precision Colour Distribution Technology improve colour consistency while producing high-density, high contrast prints and still achieving B&W speeds up to 12ppm.[1]

You can...

Canon

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CS0445/5

Digital dreaming

Kodak's $590 Advantix Preview Camera may look like a digital camera, but it's an illusion. It is the first camera to combine conventional film, in the APS format, with the digital technology of a large LCD preview screen. This has some benefits, but if you want a digital camera with all those digital benefits, go for the real thing.

Full review at **www.apcmag.com/ontest**

Disconnect

The Sagem WA 3050 is the first Windows CE-based phone to be commercially available in Australia, and as such it takes a gamble. Being first off the block in its class — that's good, especially if you need to reinforce your alpha-geek status. However, it risks having to sort out first-time bugs, and that's bad, especially when they're still so very evident in the finished product.

Full review at **www.apcmag.com/ontest**

Sony Network Walkman NW-MS9

RHYTHM STICK

Sony has upped the style and functionality of its Network Walkman range to create an even better digital music player.

The NW-MS9 is small, thin and light and leaves plenty of room in your pocket for other things. The unit takes one long, thin Memory Stick and one long, thin rechargable battery. The rest is just a casing wrapper to house the two, but a well-designed one-handed wrapper it is. The main control button has a see-saw design — rock forward or back to skip tracks, and push the lot in to stop or play tracks.

The player abides by the SDMI (secure digital music initiative) guidelines to prevent piracy. You can play as many MP3s on the Walkman as you want — regardless of where you obtained them — but they have to be converted to Sony's own secure music format first.

This ATRAC3 format is a lossy compression codec, which is fine when ripping from CD, but when converting MP3s you're running a second lossy compression codec over an already lossy compressed file which drops the audio quality.

The player comes with OpenMG jukebox software, which is used to 'check-in' and 'check-out' music to the player. Files can only be downloaded back off the player onto the system on which they were originally uploaded.

The NW-MS9 is one of the best players *APC* has played with. The audio is crystal clear and deep, and the supplied ear bud headphones are of high quality — but its clarity and 64M capacity will set you back a lot of cash.

Darren Ellis

Contact Sony
Phone 1300 137 669
Online www.sony.com.au
Price $899
Verdict ▮▮▮▮

Ricoh Caplio RR10

MOVING TARGET

For a digital camera, the Ricoh Caplio RR10 feels a lot like a mobile phone. The shape, the weight and the endless list of cool features all make it the ultimate roving image and communications tool.

The Caplio lives in a cradle that hooks up to a computer, so it's always recharged. When it's roosting, it works as a Webcam. The world looks clear and true through the 2.1-megapixel CCD view screen and 2x optical, 2x digital zoom lens. However, reviewing your images in the onscreen menu almost requires a PhD in manual reading.

Once you master the basics, there's so much you can do with the Caplio that it's hard to ration the 64Mb on the SD memory card. You can make short video clips (up to six minutes), or take a sequence of still shots using the continuous shooting mode. If you're aspiring to a career in espionage, there's a low-res mode for shooting text (up to 640 shots). Record in audio mode (WAV format), or catch short quotes from your subjects and attach them to an image. You can download your favourite MP3 and keep it handy for spare moments — audio on the Caplio sounds great.

This is a camera setup for those on the go, but when it comes to shifting images to your PC, the Ricoh Gate software lets you down. The single button on the Caplio's cradle transfers files in a shot, yet the software only has basic emailing and printing functions. To view and edit a photo, it just links up to an image editor. In the end, you're better off managing your photos and the Webcam with your own software.

Once you get over the learning curve, this do-all device fits so neatly into a PC or notebook setup, you won't know how you lived without it. A lot like a mobile phone, really.

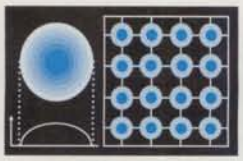
Fiona Angus

Contact Ricoh
Phone 1300 363 741
Online www.ricoh.com.au
Price $1,299
Verdict ▮▮▮▮

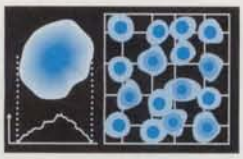
I can...

...print photos with zero discernable grain.

High precision dot control.



S800.



Lower-level technologies.

Smaller, better ink droplets.
A unique Canon process called MicroFine Droplet Technology™ uses 4 pico-litre ink drops. A special star shaped nozzle creates near perfectly round, centre weighted droplets for more accurate placement.

MICROFINE DROPLET TECHNOLOGY

Star shaped nozzle.

2400 dpi, super low density ink.
The S800 uses a 1200 dpi nozzle with interleaved printing to achieve 2400 x 1200 dpi. Special low-density inks are approximately 1/6 the density of normal inks. These have an apparent dot size equal to 0.67pl of regular ink.

2400
dpi plus Microfine Droplet Technology

USB *Parallel and USB interface for Windows and Mac.*[1]

SuperPhoto mode, 49 tonal levels.
In SuperPhoto mode the S800 can print up to 42 ink droplets per pixel. This allows the printer to achieve 49 tonal levels with zero graininess, even in highlights or gradations where dots are normally distinguishable.

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

3-YEAR WARRANTY OPTION

Extra large print heads with 6 separate ink tanks.
There are 256 print nozzles per colour on the print head. Separately replaceable, transparent ink tanks and a smart monitoring system help maximise operating economy.

Separate ink tanks.

S800
colour Bubble Jet™ printer

Just $649[RRP]

You can...

Canon

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CS0445/6

A mouse with more

Put all your fingers to work with the five buttons on Kensington's Mouse-in-a-Box Optical Pro ($89.95). The two side-mounted buttons and clickable scroll wheel give you five extra shortcuts in every application, as well as the desktop, so you can fast-track boring editing jobs with just one quick click. You can even email faster by programming your favourite phrases to appear at the click of a button.

Full review at **www.apcmag.com/ontest**

Epson Stylus Photo 895

SHINE ON

The creative process is filled with angst, but the budding digital photographer no longer has to be tormented by their printer. The Epson Stylus Photo 895 churns out beautiful glossy photos in sizes, colours and textures that can do justice to any artist's vision.

With a magnificent six-colour 2,880 by 720 dpi resolution, you need a keen eye to tell the difference between a commercial print and a home-made photo. Slot your digital camera's SD memory card into the CompactFlash adaptor (or buy a PC Card adaptor) and you've got a stand-alone photo-lab. Sound too good to be true? It is. Selecting photos using the photocopier-style control panel is a risky way to treat a $2 sheet of photo paper. Epson sells a tiny LCD viewer that attaches to the printer, but why bother when you can do so much more on a PC?

The Epson PhotoQuicker software manages the production process so you don't have to waste a centimetre of precious paper. Align photos to the edge of the page and tweak the digital enhancement settings for best effect.

Printing through a PC is also faster than a memory card; a full A4 photo takes nine minutes, while text prints at a more sedate 30 seconds per page.

The 895 is just one part of a home photo lab. Photos look grainy with evident banding if you don't use Epson's premium quality (and premium priced) Quick-Dry inks and special glossy paper, and regularly clean and align the printer. There's everything here to get a digital photographer started, but you've got to keep paying to keep going. If you do, though, the fun factor is worth it.

Fiona Angus

Contact Epson

Phone (02) 9903 9000

Online www.epson.com.au

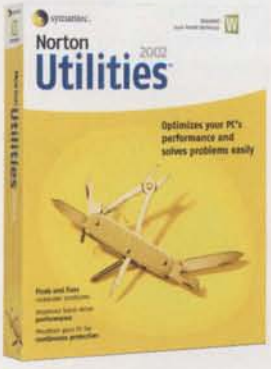
Price $799

Verdict ▮▮▮▮

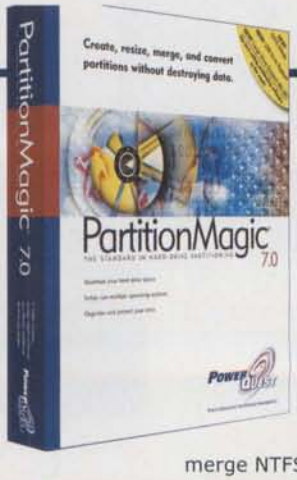
Not too NU

Norton Utilities is a highly regarded toolkit, but the 2002 edition contains only minor refinements — most made with Windows XP in mind. Previous versions won't run under XP, so if you're moving to the new OS, you will need to upgrade to NU2002. If you're sticking with an old Windows, and you already run a version of NU, stay seated.

Full review at **www.apcmag.com/ontest**



Partition Magic 7



SLICE 'N' DICE

Running several partitions is the optimal way to organise your data on your hard disk. Dividing a drive into several partitions for data, applications, scratch space and even games helps make it much easier to keep track of everything. And if you're considering running several different operating systems, then it's vital to use a partition for each different OS.

Partition Magic is the easiest way to manage and control hard disk partitions. The graphical interface is far simpler than the text one of Microsoft's antiquated FDISK application, which is capable of only partitioning drives, not resizing, converting and updating individual partitions.

Using FDISK also means that any information contained on the partitions is lost when you change them. Partition Magic can create a new partition in several formats including FAT16/32, NTFS and Linux EXT2/Swap, and then transfer the data from an old partition onto a new one transparently.

Also included with Partition Magic 7 is Boot Magic, a simple boot-loader that enables you to choose which partition you would like to boot from if you run multiple operating systems.

Minor upgrades have been made to Partition Magic 6.0 for the new 7.0 release, including support for Windows XP, which lets you create, modify and merge NTFS partitions under Windows XP — a boon for anyone trying to move lots of data.

Version 7 introduces support for drives of up to 80Gb and USB drives. You can also undelete a partition using rescue disks if you make a mistake.

Although Windows 2000 and Windows XP come with a utility that converts FAT drives to NTFS — indeed XP's drive support is much improved over previous Windows versions — it still doesn't have the functionality and speed of Partition Magic.

Matthew Overington

Contact ACA Pacific

Phone (02) 9922 5333

Online www.powerquest.com.au

Price $127

Verdict ▮▮▮▮

I can...

BJC-55.
Ultra small, ultra light, including Li-ion battery. Weighing only 900 grams, the BJC-55 is approximately ½ the size and weight of the BJC-85. Using the included battery and IrDA interface it is capable of cordless communications out of the box. An international AC power adaptor is also included.

BJC™-55
colour Bubble Jet™ printer
Just $649[RRP]

...fit in a briefcase.

BJC™-85
colour Bubble Jet™ printer
Just $429[RRP]

BJC-85.
Super powerful portable printer, international adaptor standard.
It fits easily into a briefcase, but offers desktop quality and flexibility. An international power adaptor is standard and a sheet feeder is built-in. IrDA 1.1 plus parallel and USB interfaces are standard.[2] A long-life NiMH battery kit is available as an option.[3]

Exceptional colour, optional PhotoRealism.
Using standard inks optimised for plain paper, both printers automatically print high quality images using Drop Modulation Technology™ with variable ink drop sizes. The optional PhotoRealism inks offer exceptional photographic printing.

High speed black and white.
A four colour print head with resolution up to 720 x 360 dpi comes as standard. Both printers accept an optional dedicated black ink cartridge with 128 print nozzles for print speeds up to 5 ppm.[4]

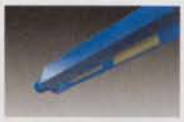
PORTABLE PRINTER CHECK LIST

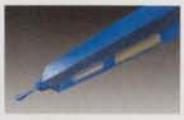
IrDA for totally cordless operation.

High speed black.

Optional colour scanner cartridge for images, fax and OCR.[1]

Four-colour print head.





Drop Modulation Technology.

Both fit into a briefcase.

USB interface included with both models.[2]

USB

3-YEAR WARRANTY OPTION

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

You can...

Canon

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CS0667/4

SPEED KI

INTEL'S | 2GHz | HOTRODS

Intel's P4 2GHz is the fastest kid on the block . . . for now

THE PENTIUM 4 2GHZ. IT'S BIG. IT'S BEASTLY. IT'S DAMN FAST. *APC* LABS PUTS FIVE HOT BOXES TO THE TEST.

NGS

BY DANIEL GARDINER

THE 2GHZ GIG

If the ongoing battle between AMD and Intel has taught us anything, it's that clock speed isn't everything. Still, it's hard to resist the allure of that magical figure: two gigahertz. It was only last issue that we first got our hands on one of these babies, and by our early benchmarks, it seemed to have just edged out AMD's 1.4GHz Athlon. But testing just one 2GHz machine wasn't enough. We wanted — nay *needed* — more.

For this Labs Challenge, each system had to meet these minimum requirements:

Pentium 4 2GHz CPU
17in monitor
128Mb of RAM
DVD-ROM

The Pentium 4 has always been good at two things: graphics and multimedia. But it was something of a surprise when our old benchmark records started getting smashed. And we mean *smashed*.

From the outset, it was an amazingly tight race. Despite the widely varying configurations, all the PCs we examined managed to excel at all day-to-day tasks, and cut it in the graphics and gaming departments too. The 2GHz CPU has enough grunt to turn a mediocre system into a veritable beast, and it was exceedingly difficult to pick an Editor's Choice. Ultimately, it came down to three finalists from different parts of the price spectrum: Dell's exceptionally cheap (but occasionally lacking) Dimension 8100, Acer's well-rounded Aspire EL and QTD's powerhouse ANSA 2-G. Read on for more.

ACER ASPIRE EL

Acer's Aspire EL is an interesting contender. It offers a fairly well-rounded package, with good-quality speakers and joystick, a speedy 20x CD-RW and even a Memory Stick port.

On the surface, it seems to have a clear advantage over its opponents — it ships with Windows XP Home Edition, and packs a whopping 1Gb of RAM. Digging a little deeper, however, reveals that it uses Intel's new i845 chipset (see *APC* October, page 22) and therefore utilises SDRAM. All the other machines reviewed here are equipped with the much faster RDRAM, so we were especially interested to see how the Aspire stood up against these formidable foes.

The case is small and stylish and has a nifty stepped design at the front. The front port cover can be slightly irritating. It hides two USB and two audio ports, along with the Memory Stick slot. It doesn't quite open far enough, which makes inserting devices an exercise in frustration, and certain large gadgets (such as IBM's Memory Key) only just fit.

As Windows Me cannot reliably handle more than 512Mb of RAM (see 'RAM Scaling', page 80), we used XP for the official run of tests on this system. (Benchmarks for both Windows Me and XP can be found on CD 1). The Aspire was strong across the board, but especially in disk performance (which was phenomenal under both OSes), and it's great for day-to-day applications as well.

The Aspire's Achilles heel is its 3D performance. While its GeForce3 still whips both the Compaq and the Dell, it fell significantly short (about 15%) of the QTD and Optima systems. Its SDRAM/i845 combination can't compete with the significantly faster RDRAM/i850 chipsets of the other systems. It seems to cause a slight bottleneck between the hard disk and the graphics card, the result of which is slower 3D rendering.

The Aspire EL offers excellent all round performance. Even with its 3D shortcomings, it's an attractive and reasonably priced system.

Quick Specs: *17in monitor, 1Gb SDRAM, 40Gb HDD, AOpen GeForce3*

Contact Acer
Phone 1300 366 567
Online www.acer.com.au
Price $4,999
Verdict ▮▮▮▮

I can...

N670U

Push button simplicity.
Three scan buttons activate ScanGear Toolbox CS (the scanner control software). It lets you select functions and the final destination of your scan such as colour printout (copy), e-mail program, fax, or others.[1]

N676U

...scan up to 600 x 1200 dpi, with each of these scanners.

Patented LIDE™ technology.
Both scanners deliver optical resolution up to 600 x 1200 dpi, while the universal TWAIN driver offers enhanced resolution up to 9600 dpi.

LIDE LED Indirect Exposure

An improved 48-bit input process.
Offers excellent colour fidelity, and creates images with smoother gradations as well as a greater amount of shadow and highlight detail.

48 bit input

Plug 'n play USB for Windows and Mac.
The USB interface is compatible with Windows 98/Me/2000 and Mac OS 8.5 or higher.[2] And, because the scanner is powered directly through the USB cable, it does not need a separate AC cable.

USB

Edit and store photos easily.
ArcSoft PhotoStudio 2000 is an easy-to-use image editor, and ArcSoft PhotoBase creates photo databases. Electronic manuals for Windows and Mac are included.

CanoScan™ N 676U
Just $229[RRP]

You can also stand up the unit to make room on your desk, and still use it to scan at any time, taking colour scanning to a new level of quality and convenience.

CanoScan™ N 670U
Just $199[RRP]

"Z-lid" simplifies book scanning.
This special lid simplifies book scanning and OCR with the bundled Caere OmniPage Pro[3] converting scanned text into editable data.

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

3-YEAR WARRANTY OPTION

You can...

Canon

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CS0669

P4 CHALLENGE

COMPAQ PRESARIO 7100 LIMITED EDITION

Attempting to cash in on the iMac look, Compaq's 7100 LE is all rounded edges and aqua-coloured translucent plastic. Unfortunately, it seems to have traded in its looks for effective design.

This is most apparent in minor annoyances associated with the case construction. The Presario 7100 is the only system to offer front-mounted FireWire *and* USB ports — a nice future-proofing technique. However, the opaque cover for these ports can be amazingly annoying: if you push too hard when closing, it has a tendency to move too far and stick shut. The built-in CD holder (located on the bottom half of the front panel) isn't much better. It's mounted on a very flimsy hinge, and it's easy to accidentally pop it open and have it — along with your CDs — come crashing down on your desk. These are, to be sure, minor problems, but you shouldn't have to put up with them when you fork out $4,400 for a computer.

It's still a fairly solid performer, although it's at the lower end of the 2GHz scale. It occasionally lagged a little in the application benchmarks due to its minimal 128Mb of RAM. Thankfully, however, the processor manages to carry a lot of the burden, and the difference was usually in the order of only 3% to 5%.

Like the Dell below, it only has a GeForce2, so it falls a little short in the 3D department. The speakers are adequate for basic use, but somewhat lacking in power, and they can't stand up to the high-end speakers of the other systems.

It's unfortunate that the processor is the only part of the system that's genuinely high-end. Poor case manufacture and lack of RAM are the 7100LE's main flaws, and seem suited to a budget system, not a monstrous 2GHz P4.

Quick Specs: *17in monitor, 128Mb RDRAM, 40Gb HDD, Compaq GeForce2 GTS*

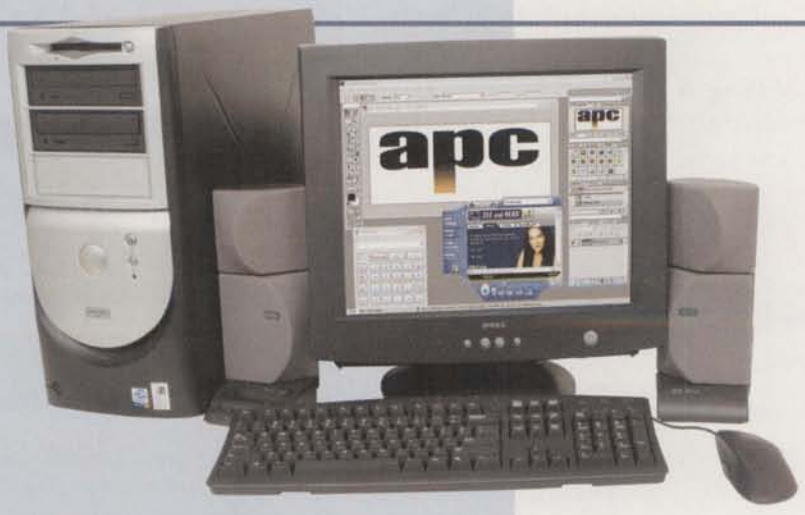
Contact Compaq
Phone 13 23 93
Online www.compaq.com.au
Price $4,399
Verdict ▮▮▮

DELL DIMENSION 8100

The Dimension 8100 is the most impressive looking of the pack, sporting an all-black finish with matching monitor, peripherals and speakers. The Dell's strongest area is sound; here it simply demolishes any competition the other systems have to offer. Its Turtle Beach Santa Cruz soundcard is the pick of the lot, offering six-channel output for surround sound with DVDs, games and music. Moreover, its Altec Lansing ADA 885 speakers — four satellites and a subwoofer — are THX-certified. The subwoofer is simply huge. At roughly the same size as an average PC case, it's powerful enough to rival most entry-level home theatre systems; you can't ask for much more than that.

The system still has some significant weaknesses, namely its small 20Gb HDD and diminutive GeForce2 GTS. Both hard disk and graphics card suffer from a similar shortcoming; while they will suffice for the time being, they'll date much more rapidly than the rest of the PC. You'll probably find yourself upgrading to a larger HDD and a GeForce3 — and paying more than you would if you bought them to start off with.

The mouse is also unusually shaped and keeps the wrist at a slight angle, and some might find it slightly uncomfortable to use.



Overall, it offers a well-rounded, if slightly flawed, package. Its affordable price means that even with HDD and VGA card upgrades, it still costs less than most of the PCs reviewed here.

A word to the wise — Dell is currently upgrading the cases on the 8100 series to include front-mounted audio and USB ports. If you wait an extra couple of weeks you'll get the improved case for around the same price.

Quick Specs: *17in monitor, 256Mb RDRAM, 20Gb HDD, GeForce2 GTS*

Contact Dell
Phone 1800 808 312
Online www.dell.com.au
Price $3,899
Verdict ▮▮▮▮

I can...

Push for film scanning

Scans 35 mm film in slides, and strips in positive and negative format.

...scan trannies

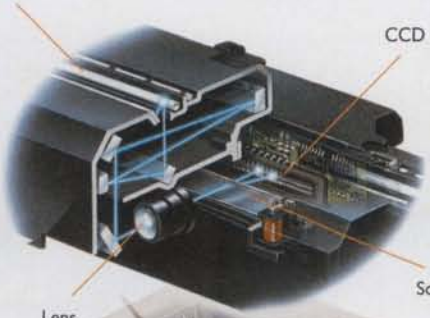
with a built-in film adaptor,

for just $299.

Push for photo scanning

Easy to use, with USB.
The CanoScan™ D660U solves diverse scanning needs simply. No adapters or add-on kits. Everything is built-in, and is available with the push of a button. ScanGear Toolbox CS lets you select the final destination of your scan such as printer, e-mail program, fax, copy or others.[1] Or, direct driver control lets you adjust scan size, resolution, and other parameters. The USB interface connects to either Windows 98/Me/2000 or Mac OS systems.[2]

Superior 35 mm film scanning with VAROS.™
The scanner cover includes a built-in back light for film that reaches an extra large CCD sensor. Much like high-speed film, it has a relative light sensitivity up to 4 times greater than many 1200 dpi CCDs. It uses Canon's innovative two-pass VAROS scanning technology where the second pass is refracted by half a pixel. It activates automatically at resolutions greater than 600 dpi, capturing data that could be lost on a lesser scanner. The result is 1200 x 1200 optical dpi film scanning in less space and at lower cost.



600 x 1200 dpi, 24-bit colour input.
Photo print and text scanning resolution goes up to 600 x 1200 optical dpi with 42-bit colour input capable of capturing more than 4 trillion colours. Data can even be software enhanced to 9600 dpi.[3]

Edit and store photos easily.
ArcSoft PhotoStudio 2000 provides tools for editing photos, and ArcSoft PhotoBase creates an electronic photo database. Also included are Caere OmniPage Pro for Optical Character Recognition,[4] plus Adobe Acrobat Reader and PDF manuals for Windows and Mac.

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

3-YEAR WARRANTY OPTION

42 bit input

CanoScan™
D 660U
Just $299[RRP]

You can...

Canon

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CS0445/10

P4 CHALLENGE

OPTIMA MYPC P42000

Optima's entry was the quiet achiever of the bunch. While it looks rather plain, it packs a punch in the performance department. Out of *APC*'s 10 benchmarks, the P42000 came out on top in half of them.

It's an especially strong contender in the 3D stakes, thanks to the near perfect combination of GeForce3 and RDRAM. There are no bottlenecks here, just pure 3D power. The Optima just edged out the QTD system (below) in high-res Quake 3. It also garnered the highest 3DMark2001 score we've ever recorded, and is streets ahead of our current AMD reference system. To put things in perspective, this system scored almost 30% higher than our Athlon 1.4GHz with 128Mb DDR and the same GeForce3.

This performance comes at a cost — the P42000 is relatively bare when it comes to extras. Its peripherals are rather plain, with the most basic keyboard and mouse of all the systems. It also lacks a true soundcard, opting for an integrated AC'97 chip. While the AC'97 is acceptable for day-to-day use, gaming and music enthusiasts will be disappointed by the lack of input and output ports — they can't stand up to standalone cards. The weak sound support is further hindered by its lack of speakers.

While it does feature front-mounted USB ports, like the Compaq and the Acer these suffer from minor design flaws. The panel tends to bend in when inserting a plug and, conversely, stick when removing devices.

Still, despite these minor shortcomings, it offers consistently high system performance. A decent choice for those who want a grunty system without the frills.

Quick Specs: *17in monitor, 256Mb RDRAM, 40Gb HDD, ASUS V8200 GeForce3*

Contact Optima Computer Technology
Phone (02) 9475 2777
Online www.optima.com.au
Price $4,799
Verdict ▮▮▮▮

QTD ANSA-2G

Are you l33t? Then get this PC. If you want everyone to know you've got 2GHz under the hood, you can't go past this hacker dream system. It comes with all the trimmings of a truly high-end system: huge 21in monitor, full tower case, Logitech wireless keyboard and mouse combo, GeForce3, Cambridge Soundworks speakers and case fans all over the place. It even comes with an optional transparent perspex window for all you uber-geeks. Throughout our benchmarking, there was a constant duel between the QTD and the Optima. No side managed to gain the upper hand for too long. Their results were often so close that it was all but impossible to pick a clear winner.

apc EDITOR'S CHOICE NOV 2001

Both systems have similar strengths — excellent 3D capabilities and stunning application benchmarks. On the down-side, neither machine has a PCI soundcard, relying instead on a no-frills integrated sound chip from Intel.

It's the extra features that distinguish the ANSA-2G. Put the Optima up against a system with twice the RAM, twice the HDD capacity, a three-year warranty and a certified overclockers' GeForce3 (complete with DVI and TV-out), and it has a hard time competing.

The ANSA-2G's main sticking point is its huge case, which is somewhat unnecessary given the small size of most P4 motherboards. Most of the interior is just wasted space.

The price is more than justified by consistently grade A components. These mean that using the system is always a fast, pleasurable experience. As far as future-proofing goes, it's miles ahead of the rest.

Quick Specs: *21in monitor, 512Mb RDRAM, 2x 40Gb HDD, 3DPower Morpheus GeForce3*

Contact Quality Technology Distribution
Phone (03) 9876 9910
Online www.qtd.com.au
Price $5,999 (Optional perspex window and neon light $88)
Verdict ▮▮▮▮▮

I can...

High-speed Galileo Lens, 1200 x 2400 dpi. The easy-to-use unit delivers studio quality 1200 x 2400 dpi optical resolution for almost the same price as many 600 dpi scanners. The five-element, aspherical lens system eliminates distortion. A shortened optical path and wide aperture lens (f-stop=5.5) increase scanning speed and improve signal to noise for a more optically accurate system. A true 1200 dpi CCD sensor is capable of finer detail and more accurate colour.

Spherical aberration — Light converges at different points.

Galileo Lens — Light converges at a single point.

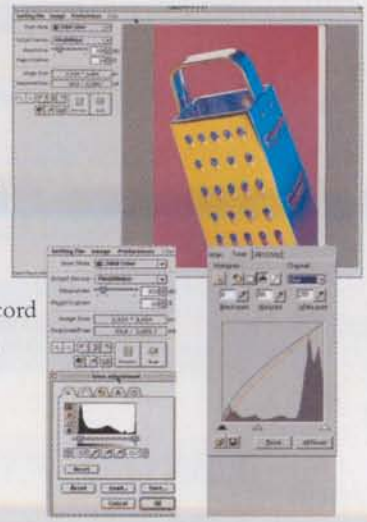
...scan film and prints up to 1200 x 2400 dpi with 48-bit colour.

High intensity film adaptor. The optional film-scanning unit replaces the standard cover for reflective and film scanning, and matches or exceeds the performance of expensive moving light source designs. The light source in the cover uses dual sheets of 3M™ Brightness Enhancement Film plus dual, high-intensity cold cathode fluorescent lamps. It accepts colour negatives and positives in 35 mm, 2¼" and 5" x 4" sizes.

Optional FAU-S12 film adaptor, $199.[RRP]

ScanGear Toolbox CS offers "point and click" simplicity.

USB and complete software suite. The USB interface connects to Windows 98/Me/2000 and Mac OS systems.[1] ScanGear control software, a universal Twain/Plug-in Driver, PhotoShop 5.0LE and ArcSoft PhotoBase are included for both platforms. ScanSoft OmniPage Pro 9.0 for Windows and OmniPage SE for Macintosh are also included for OCR. Canon PhotoRecord (Windows)/ ImageBrowser (Macintosh) helps users to easily copy, enlarge and print photos.



Advanced manual controls.

CanoScan™ D1230U

Just $449[RRP]

Canon Customer Care. The one-year warranty is upgradeable to three years for a minimal charge, and is backed by Customer Care hot-line support. For more information call 1800 021 167.

3-YEAR WARRANTY OPTION

48 bit input/colour

48-bit colour input. True 48-bit input and 42-bit output increases subtle tonal variation and colour accuracy.

You can...

Canon

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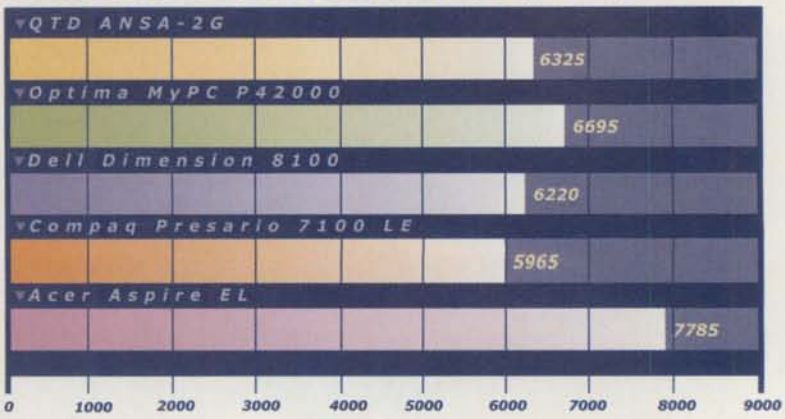
BENCHMARK RESULTS

ZIFF-DAVIS WINBENCH 99 (2.0)
BUSINESS DISK WINMARK:
Business Disk tests the day-to-day performance of a hard drive. Its average speed when retrieving and manipulating data is measured using timed tests.

At first glance, the Acer is streets ahead of the other machines here, but it has something of an unfair advantage because it was tested under XP (due to the fact that its 1Gb of RAM is unsupported by Windows Me). XP has optimisations that can give an extra 10% to 15% boost to Business Disk scores, so under Me it was around the same level as the Optima (the next highest scoring machine).

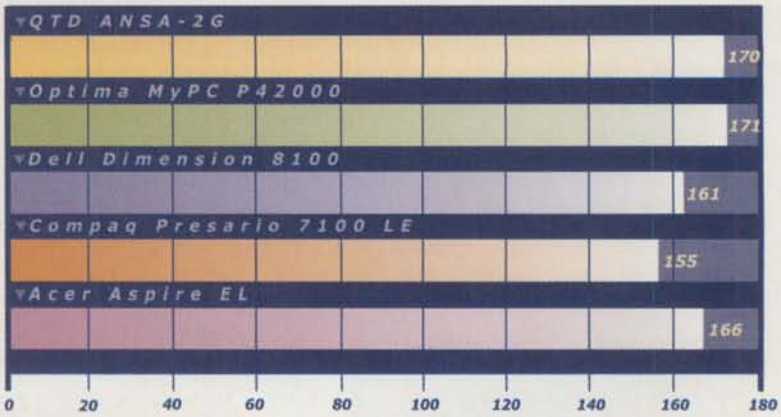
BUSINESS DISK WINMARK 99 (V2.0)



SYSMARK2001 (PATCH 3)
SYSmark2001 uses a number of everyday applications, such as Outlook, Word, Flash and Photoshop to gauge a system's capabilities. Tasks such as creating emails, documents and Web pages along with editing images help test how the system performs under 'real world' situations.

It was in application benchmarks that the least variance between systems occurred — there was roughly 10% difference between the lowest and highest scores. All the systems scored amazingly high — even the slowest machine scored higher than any Labs has tested in the past.

SYSMARK2001



3DMARK2001
3DMark tests a video card's 3D rendering capabilities at high resolution. It uses a slew of new features in DirectX 8 (which are currently being implemented in many new games), and is helpful in gauging how a card will perform not just in present games, but in future ones as well.

Graphics saw the biggest variance, thanks to the vastly different configurations of each machine. Both the Dell and Compaq are severely outclassed in this department — their GeForce2-based cards simply cannot compete with the GeForce3's of the other systems. Both the Optima and QTD absolutely shattered the previous benchmark highs. The most surprising results came from the Acer — it's significantly slower than its GF3 brethren due to the use of SDRAM (see page 40).

BUSINESS DISK WINMARK 99 (V2.0)

DISCLAIMER

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I can...

ScanGear is also a universal TWAIN Plug-in driver that offers direct control for pre-scan settings or enhanced resolution up to 9600 dpi[3] for applications such as the bundled Adobe Photoshop LE.

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Canon's patented LIDE™ Technology is a flatbed scanning breakthrough that changes the scanner price/performance ratio. The 48-bit colour input, demonstrates the evolution of this technology, delivering superior tonal gradations in a super slim design.

48 bit input

LIDE LED Indirect Exposure

Simple, professional quality software.
The one-touch scan buttons activate ScanGear Toolbox CS to select the destination of your scan such as colour print out (copy), e-mail program, fax or others.[4] Edit and store photos easily with ArcSoft PhotoBase, which creates electronic photo albums, and ArcSoft PhotoStudio, which allows for easy image editing.

"Z-lid", advanced OCR.
This special lid simplifies book scanning and bundled Caere OmniPage Pro[1] OCR converts scanned text into editable data.

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RIGHT: LET'S GET SERIOUS

HAD A RAW DEAL? STUCK WITH A LEMON? WATCHDOG TAKES UP THE FIGHT FOR YOUR CONSUMER RIGHTS. *By Fiona Angus*

At the Simpson Barracks in Melbourne, if a new recruit misses a target on the firing range, they call it a 'Gateway'. This is the kind of ribbing you get if you try to avoid owning up to your mistakes and you're under the command of Company Sergeant Major Daniel Grovenor. For the past 12 months, he's had more success drilling his 110 new recruits into shape than in getting Gateway to fix his computer.

Dear *APC*,
I have reached a stalemate with Gateway. From the moment I unpacked my new 733MHz system, I've had problems: it wouldn't connect to the Net, the mouse stalled and the speakers crackled. A technician came around and replaced the motherboard but refused to touch the other problems. When I complained again, they sent me another motherboard. I asked them to replace the entire system, but they just sent me yet another motherboard! My 12-month warranty is about to run out, so it seems Gateway's lethargy will succeed.
Daniel Grovenor
Yallambi, Vic

Gateway told him to take the machine to one of its contractors, but then refused to transport it there. "It seems we have a difference of opinion on what is implied by a one-year onsite warranty," Daniel said. Besides, the contractor told him they were just planning to replace the motherboard. To add insult to injury, Gateway sent him a bill for the unwanted motherboard.

Watchdog stepped in to mediate. After reading Daniel's letter, Gateway agreed to arrange a courier, but wasn't backing down on the bill: "The invoice has been issued for the non-return of parts supplied by Gateway," the company stated. "When the motherboards are replaced by Gateway, the old motherboards are required to be returned to Gateway when the new one is fitted. Gateway provides an empty, pre-addressed courier satchel for the customer to return the faulty part. Gateway then checks the component for the cause of the problem. As neither of the motherboards has been returned to Gateway, a $700 invoice was issued. When these parts have been returned, the invoice will be cancelled."

What's this? Daniel no longer had any motherboards. The bill was for the motherboard that was with the contractor. Watchdog checked with Gateway, and it mysteriously "accounted for" the other parts. Three weeks later, the entire machine was carted off for "line checking" and ended up with a new hard drive. Daniel just hopes it will last — unlike the hard drive in another reader's Gateway PC.

Dear *APC*,
The hard drive on my Gateway Pentium 4 died after just three months. Instead of replacing my IBM 60Gb drive, they sent me a Quantum 10Gb drive. After I pointed this out, they posted out another Quantum drive, this time with the right capacity. Other retailers sell this for around $60 less than my original IBM drive, but when I tried explaining this to Gateway staff, they were most unhelpful. I finally got to speak to a manager and he agreed to extend my warranty for another month. He has since ignored all my requests for a written copy of the warranty. Now Gateway has sent me three invoices for the (broken) IBM drive. I honestly don't know what to do.
Sam Wright
Chatswood, NSW

We showed Gateway Sam's letter, and it agreed to give him the right IBM drive and a written warranty. This turned out to be a hollow victory. When Sam unwrapped his 'new' drive, he was shocked to see a "serviced part" sticker on it. "Although it looks new, I have a sneaky feeling they've sent me a refurbished drive," he said.

Gateway wouldn't tell Watchdog if it was second-hand. "All parts are either new or serviceably used, as per warranty," was its curt response. "[Sam's] initial claim had to do with the fact that the replacement hard drive was not of equal quality to the IBM. He now has an IBM drive." Sam doesn't trust the 'pre-loved' drive and has added it to his growing collection of broken and unwanted Gateway parts.

Meanwhile, Gateway is still demanding he either pay for, or return, the extra drives. "I want to hold on to [the drives] until I get my written warranty," Sam said. He waited and waited for the promised warranty before Gateway pulled the ultimate 'Gateway' and went out of business in Australia. "To be totally honest, I doubt I'll ever see it," Sam said. ■

UPDATE Last month, iPrimus copped some flak from readers about their customer service. "Customers have a right to be annoyed," general manager Ash Chopra said. It turns out that from late May to early September, 70,000 ex-One.Tel customers joined iPrimus. Stressed staff had to cope with this on top of their regular 300,000 subscribers. In all the chaos, call centre staff weren't being replaced. iPrimus has since hired 50 new call centre and 15 new tech support staff (with more in training), and staffing levels are reviewed each week. "You can ring up our customer support line now and see," Chopra offered. It took 31 minutes for Watchdog to get through.

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A USB interface for Windows 98/Me/2000 and Mac OS systems,[1] Twain/Plug-in Driver, PhotoShop 5.0LE, ArcSoft PhotoBase, OCR software and photo management software for both platforms are also included.

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FEEDBACK LOOP

CARDBOARD VERSUS PLASTIC

I like the new look and content of the mag, but I do have a problem with the CDs being returned to a cardboard pocket. The postman recently delivered another mag with the same packaging and the CD came out in several pieces. It cheapens *APC* to place its valuable software in a cardboard pocket. The break-proof plastic case gives real value and allows for practical storage and access. Isn't that the point?

Brian Knight
Box Hill, Vic

Believe us, Brian, replacing the plastic cases with cardboard was not a matter of choice. We're not going to spin you a line that cardboard is more high-tech or dolphin-friendly than plastic. The fact is that Australia Post told us that the combined width of a plastic double CD case and the magazine (a whopping 200+ pages of fab reading) would have bumped APC *into the postage category of a 'parcel', adding some $3.40 to every single issue sent to subscribers. That's something we weren't prepared to force on our loyal readers, so we scoured the world for a slimmer CD case. In the end, the cardboard case was the only one that could handle two CDs and stay under our budget and the Australia Post limit. If you find something better, please let us know.*

To help you organise your favourite APC *CD software, we've set up a special CD index where you can search for programs on any* APC *CD from January 2001 onwards. Just go to the latest CD or apcmag.com. Enjoy.*

MIND SHIFT

I have just finished reading your 'Robo Crop' article (*APC* October, page 80). It is great to be reminded that our researchers are so far ahead of the world, but it makes me feel sick to see great Australian ideas going overseas due to lack of funding. We need a hell of a lot more than a Knowledge Nation — we need Aussie investment, R&D and more money for our universities. But more than that, we need to keep those ideas here to promote our own industries and not just end up promoting foreign industries. As your article suggests, I pray that all Australians will make the mind shift to see that we are more than just a digging or farming nation, and start investing in our people and industries.

Ralph Lett
Punchbowl, NSW

WHAT THE .NET?

One of the more interesting developments around .NET is Microsoft's decision to team up with Ximian to port .NET to Linux. While many people are excited, others argue that this is just Microsoft's way of trying to destroy the free software movement. Most people are simply confused. Why would a proprietary company like Microsoft team up with an open source organisation to make some of their newest ideas available on a free and open operating system at the same time as entering a very limited shared source licence agreement? Well, Microsoft knows it is never going to own 100% of the desktop market, so it is trying to grow in a

LETTER OF THE MONTH:

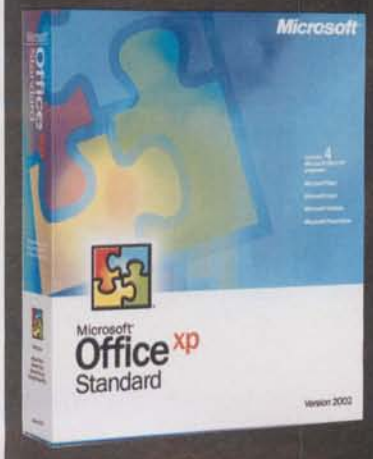
HOLDING ISPs TO ACCOUNT

The time has come to hold our Internet service providers to account for the quality of their service. Allow me to illustrate: I entered into a nine-month contract for a satellite-based service, which was advertised as "up to" 400Kb/s. At first my expectations were exceeded, but over the last six weeks, the service has declined to the point that I have not encountered a download speed above 100Kb/s. At times, my old 33.6Kb/s dial-up account has been faster. I would like to change my ISP; however, the "contract" I entered into specifies my *obligations* very carefully, but not my *rights*. ISPs should be required to meet certain (independently verified and publicised) service standards. This way, consumers would have measurable performance indicators they can use to select an ISP, as well as grounds to terminate a contract where these standards are not met. Many industries submit themselves to independent audits of their service standards; it's time ISPs did too.

Ray McHenry
Harkaway, Vic

THIS MONTH'S PRIZE

RAY'S TALES OF ISP WOE MADE US feel so sorry for him, we chose his missive as Letter of the Month. His prize is a copy of Microsoft Office XP, with the latest 2002 versions of Word, Excel, Outlook, PowerPoint and Access.



slowing market by making sure every non-Windows system is running .NET. This may not be a bad thing, as it will give all of us the option of using the best Microsoft software without moving to Windows.
Rob Garth
Penrith, NSW

A STEP UP
Why won't ISPs support CGI? The Web has become so enormous because ordinary people are building their own Web sites using HTML or programs like Dreamweaver. In this, our ISPs have helped by providing Web space for their customers. The next step is dynamic content. Many Net users have investigated Java, JavaScript, Perl/CGI, ASP, PHP and other programming languages in an effort to make their sites a bit more interesting. But after searching countless ISPs, I have found only a few who will provide PHP and/or CGI facilities at no extra cost. I realise CGI has security problems, but most servers with such abilities have protection. ISPs should think about supporting tools that let customers learn more about Web development.
Pat Allan
Northcote, Vic

THAT'S LIFE
As an official beta tester for Microsoft Windows XP, I was surprised by the letter from Chris McMahon (*APC* October, page 78) regarding the technical glitches he had with his preview copy of Microsoft Windows XP Professional. I'm sure that when Chris purchased his 'preview' copy, he read the End User License Agreement, which specifies the product is not covered by any technical support and may cause various system problems. Welcome to the world of beta software, Chris — it's full of bugs.
Rodney Mayhew
Albany Creek, Qld

BAD IDEA
I'm puzzled by Gavin R Putland's challenge to the open source community to replicate Microsoft Windows and Office (*APC* September 2001). All I can say is, what for? I use Linux (and OpenBSD) because it has its roots in Unix. I have no interest in Windows. Why would you want the open source community to build a rip-off of a product that is completely unstable and spreads viruses like wildfire?
Guy Hunter
Carnegie, Vic ■

We welcome comments and suggestions. Send correspondence to:

epinions, APC Magazine, PO Box 4088, Sydney NSW 1028, or email epinions@apcmag.com

Letters can also be submitted online at **apcmag.com.** All correspondence becomes the property of *APC* and is subject to editing.

HOW TO CONTACT US

Well done on the new look mag and Web site — very attractive, modern and readable. I find it interesting to see how Web design has influenced print design. Where once 'new' Web design was heavily influenced by print trends, now it seems to go both ways.
Mathew Patterson
Sutherland, NSW

I'm very disappointed in the new-look *APC* — it looks like an in-flight magazine. I can't tell the difference between an article and an advert and the reviews make me feel as if I am being sold to, which as an Australian, I loathe.
Brent Shire
Arundel, Qld

I've just got my copy of the new-look *APC* and I have to say that it looks a million times better than the old one. However, I think you need to work on organising the sections more clearly because right now there's no clear distinction between each section. Keep improving it guys — you're nearly there.
David Schaverien
Castle Cove, NSW

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Get close up with Windows XP

XPOSED

WINDOWS XP SUPERGUIDE

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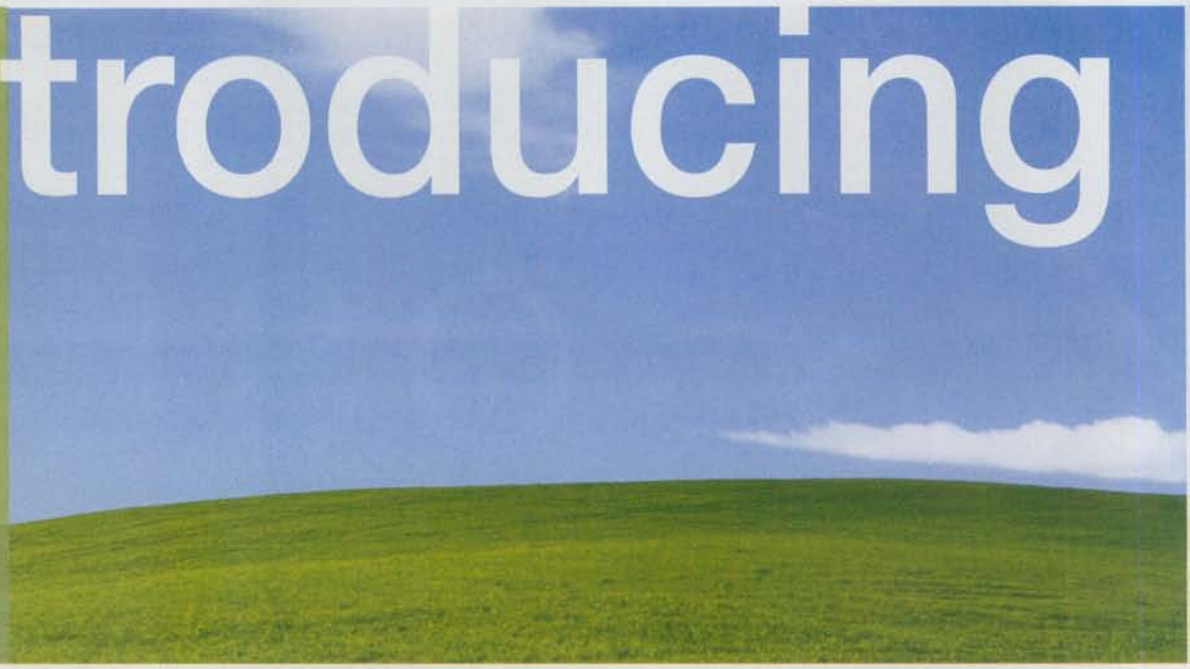
Project leader: *David Flynn*

Writers: *Darren Ellis, David Flynn, Daniel Gardiner, Ashton Mills, David Neiger, Matthew Overington, Serdar Yegulalp*

Introducing



WHAT DID IT TAKE TO MAKE WINDOWS XP THE BEST WINDOWS YET? A MICROSOFT VP, A MEDITERRANEAN CRUISE AND A DOSE OF THE BLEEDING OBVIOUS. DAVID FLYNN KICKS OFF OUR SPECIAL REPORT ON MICROSOFT'S ALL-NEW OPERATING SYSTEM.

It's sometimes called a Tarsian conversion, or a 'road to Damascus moment' — the eyes-wide-open epiphany when you suddenly, finally *get it*. Jim Allchin *got it* in the middle of last year, on a boat on the Mediterranean.

"We all had notebooks, running all sorts of versions of Windows" recalls Allchin, whose slender frame, white hair and sharp blue eyes create an elfin appearance that's completely at odds with his formidable position: Microsoft's vice president in charge of operating systems.

"People were taking photographs with their digital cameras, making movies, then loading them onto their notebooks to edit and send through email with their cell phone. And everyone had all these problems. Things wouldn't work, and then Windows would crash. And I realised just how frustrating Windows could be." It's also sometimes called The Bleeding Obvious.

Hadn't the untold millions of phone calls made to the Help line over the past 10 years since the release of Windows 3.0 given Microsoft's brains trust a bit of a clue? Wasn't anyone reading the call logs, studying the press reviews? Maybe they should take Mediterranean cruises more often, because the results speak for themselves. Windows XP is the Windows we've been waiting for.

Long-time readers know that *APC* is no soft touch. We're not given to easy praise. We've aimed our share of kicks at the shins of the software colossus. But when Microsoft gets it right, we'll say so. And with XP, the software giant got it very right.

Windows XP rolls together the friendly face of Windows 95, an OS designed to make the PC usable by everyone, with the robust performance of Windows NT, an industrial-strength OS built for speed and stability. It's been a long time coming: Microsoft has been promising such a move since 1998. Now that it's here, we've put it through its paces to prepare this special 25-page guide to Windows XP, covering everything from the new interface, to exhaustive testing, to the steps involved in upgrading successfully.

Is XP very different from the Windows you're using already? Yes, but it's a good difference. Let's put aside the slick look of Windows XP for a moment. Actually, let's not. It *is* pretty flash. And why shouldn't it be? If you're going to spend most of your day in front of a computer, it may was well look good. It may as well have great depth of colour, cool icons, and sensible visual cues.

In previous versions of Windows, many options were tucked out of sight, revealed only by a right-click of the mouse (a hallmark of the Windows expert). Now there are shortcuts aplenty, positioned front-and-centre with their own buttons. XP is smarter about what you want to do. Attach a digital camera and you're presented with options to bring the images onto your PC, edit them, print them or email them. And there are more wizards than in a Harry Potter book.

It's ironic, then, that the development of Windows XP — the OS with such an obvious focus on ease of use and wooing the average home user — was spearheaded by the man previously in charge of Microsoft's enterprise and server operations. Allchin was 'the server guy'. His specialty was software that ran on big iron. Software that has no time for mums and dads. But families have become the reality check. Almost every 'Softie who does an XP spiel seems to have photographs of their kids somewhere in there, as if in accordance with a company-wide edict that they should go forth and multiply. Bill's Breeders, they should call them. And if it's not the kids they're talking about, it's the parents.

Windows XP

"My mother wanted to buy a digital camera last year but I talked her out of it," relates Allchin. "I knew what the experience would be like and I knew all the phone calls I was going to get. She wouldn't know how to connect the camera, or where the pictures were stored, or how to print them or email them to us.

"The PC has this stigma. It's viewed as frustrating, and complex. It's work, not fun. I can contrast that to the Mac. XP aims to bring Windows closer to a Mac-like experience of user enjoyment."

PC equals boring. Windows equals frustrating. Mac equals fun. It's a recurring theme. In February this year, while attending a media preview at Microsoft's sprawling Redmond campus, I watched a presentation from Joe Belfiore, the animated designer of the original Windows 95 shell who's been brought back onto the field to craft the new face of Windows XP.

WINDOWS XP GENERALLY STARTS UP AND SHUTS DOWN SLIGHTLY FASTER THAN WINDOWS 2000, AND MUCH MORE SO THAN WINDOWS 9X.

Belfiore walked us through a series of slides which pitted 'sensual', products that engage the human senses, against 'mechanical' objects where function dictates form. The Guggenheim and the Opera House are sensual; the Pompidou Centre and a Frank Lloyd Wright house are mechanical. Lotus and BMW convertibles score sensual oohs and aahs; a highly functional Range Rover is met with uninspired silence.

Now comes the technology slide. An iMac, a Palm V handheld and the 'Aqua' interface of MacOS X — three of Microsoft's bêtes noirs — are ranked in the sensual category. Microsoft's only entrants are the curvaceous IntelliMouse Explorer and the dolled-up dumbed-down MSN Explorer Web browser.

Where are the star players from the home team? Relegated to the mechanical league: Windows 95, Windows 2000, even the Windows Media Player. Windows XP wasn't on that slide; it was yet to enter its second round of beta testing. It had been given its name only a week before, and the demonstrations were done on an early beta build still tagged with the 'Whistler' cypher. But when the new desktop and interface were revealed for the first time to us that afternoon, and as the visual effects were paraded, XP garnered its own share of oohs and aahs.

Is it faster? In parts. Windows XP generally starts up and shuts down slightly faster than Windows 2000, and much more so than Windows 9x. The 'hibernate' mode works a lot faster: to suspend a 128Mb system takes less than 10 seconds, as does bringing it out of hibernation.

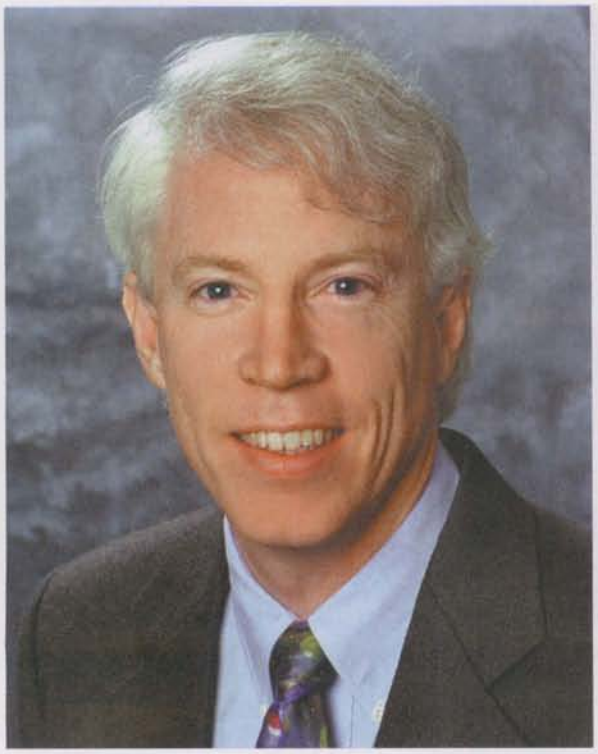
Interestingly, in our testing, Windows Me clocked higher than XP for intensive hard disk access — the sort of hammering you'd give a PC if you were editing digital video, for instance. But that's precisely the sort of task for which Me and its 9x brethren no longer cut the mustard: in raw processing power they're not fast enough, nor can they make use of memory much past the 256Mb mark, and they tend to fall over under pressure.

Conversely, Windows XP outstrips 9x on exactly those points. It's swift of foot, it charges ahead with every extra slab of memory you throw at it, and it's built tough.

So although XP is sometimes no faster than Windows 2000 or even 9x, it's still better. The few times it's slower don't count as the difference is minimal, and the usability gains you get from XP's improved interface more than compensate.

NEED TO KNOW

When: Windows XP goes on sale 25 October
How much: $462 (upgrades, $238) for Windows XP Home Edition; $675 (upgrades, $462 for Professional)
What do I need: *APC* recommends at least a 500MHz processor with 128Mb of RAM and 2Gb of free disk space.



Jim Allchin: at last he realises "just how frustrating Windows can be".

Can your PC run Windows XP? As a rule of thumb, any PC less than two years old is up to the job. You may need to add some memory, because like all versions of Windows, XP has a rapacious appetite for RAM. Luckily, this is less of an issue today than ever before. When you can buy 256Mb of brand-name memory for $55; when 50 cents per week over a two-year system lifespan will set your PC soaring (so you spend less time waiting and rebooting, and more time doing stuff); when a brand new PC has so much power that the numbers start to become meaningless, it's no time to skimp on RAM. If you think your PC is already too slow under Windows 9x, then it's certainly not ready for Windows XP.

What are the differences between the Home and Professional editions of Windows XP? Not much, truth to tell. XP Home has more than Windows Me and 2000 put together; every feature discussed in this guide is included in the home package, with the exception of the remote control program. That's restricted to XP Professional, along with some higher-level security, networking and management tools. If you're not sure you need Professional, you almost certainly don't. For home and many small businesses, XP Home is ample.

So, to the bottom line: is it for you? Should you, must you, upgrade? If you're running Windows 2000 — in a business, or for advanced personal use — Windows XP is a maybe. It offers fewer gains for the office desktop or the notebook than for home users. Check XP's shopping list of features against your current needs.

However, if you're using Windows 9x, and your PC can handle the load, XP is the only way to go. You don't have to do it right away — some people may choose to wait until all of their hardware is supported by the new OS — but you should definitely make the move to Windows XP.

PS: Jim Allchin has bought his mother a digital camera.

THE ROAD TO XP

Windows XP has had perhaps the longest gestation period of any Windows release. In spirit, the journey began in 1998, with Microsoft's decision that Windows 98 would be the end of the line for the 9x platform. While the cut wasn't that final, from that moment forward Windows 9x was living on borrowed time.

Through 1999, Microsoft had two next-generation operating systems being developed in parallel, both based on the NT engine. 'Odyssey' was the codename for the next release of Windows 2000 Professional. 'Neptune' was the anointed successor to Windows Me, which removed the high-end wiring in Windows 2000 and adding features more suited to the home market.

A cornerstone of Neptune's consumer focus were 'activity centres' — Web-like windows that grouped together the most common tasks for a single activity.

Neptune was to have a suite of activity centres for music, photography, communications, games, home networking and help. Although eventually scrapped, the technology resurfaced in Windows Me's Help and Support hub, the Windows Media Player (almost a direct lift of Neptune's proposed Music Centre), and the task panes in Windows XP and Office XP.

In December 1999, Neptune and Odyssey were junked in favour of a single integrated OS named 'Whistler' (after a ski resort in British Columbia, close to Seattle and popular with Microsoft powderhounds). In August the following year a rough-hewn alpha release appeared, quickly followed by the first beta release in October. Five months on saw a stable beta 2 and the christening of Windows XP.

The successors to XP are already underway, with 'Longhorn' due in 2002/2003 and 'Blackcomb' in 2004 (both are named for ski mountains near Whistler). Microsoft's research division is working on next-gen interface models, one of which is a towering combination of the Start menu and task-based activity centre with instant messaging that runs the full height of the screen.

The task-oriented Photo Centre from the abandoned 'Neptune' version of Windows.

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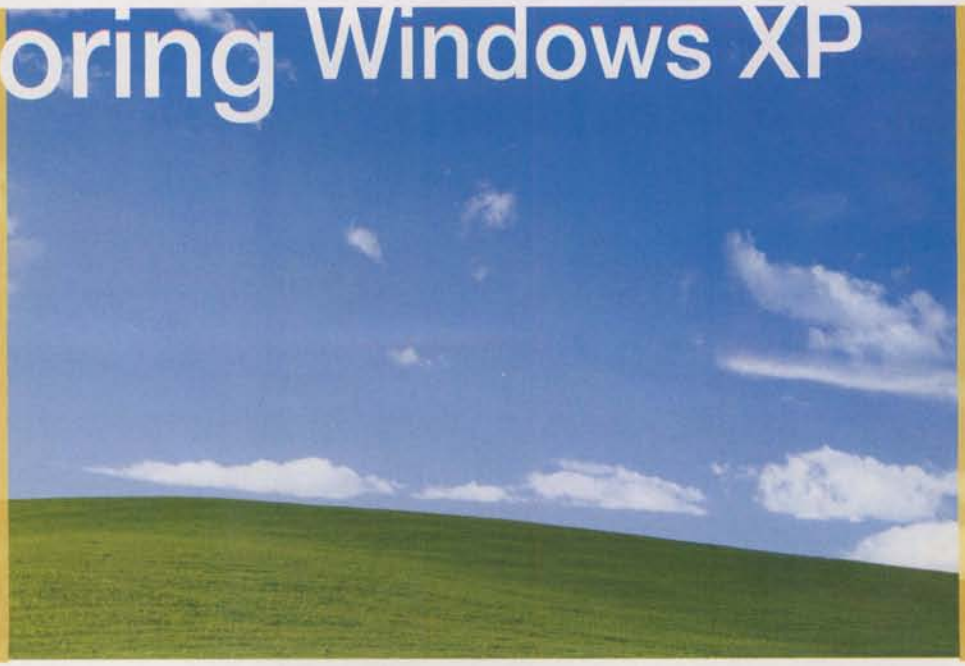
Exploring Windows XP



WINDOWS XP IS MORE THAN A MERE INTERFACE LIFT FOR YOUR PC. IT'S WHAT'S INSIDE THAT REALLY COUNTS: A ROBUST 32-BIT ENGINE BUILT FOR SPEED AND, MORE IMPORTANTLY, CRASH-PROOF RELIABILITY.

Putting aside the lush lures of the new Windows XP front-end, the most significant part of the package is what's under the bonnet. Ironically, those inner workings are new only in the sense that they're just now being implemented in an 'OS for the masses'. XP inherits its heart and soul from the foundations of Windows NT and Windows 2000.

The main distinction between the way NT and the 9x line of operating systems is built has to do with the difference between 16-bit and 32-bit programming.

Windows 3.1 was written as a 16-bit OS, and as such, could not employ the more advanced instructions or memory-handling features in the Intel chipsets of its day. Despite this, Windows 3.1 enjoyed tremendous popularity, and by 1995 an enormous installed base of users had sprung up around it.

Windows 95, on the other hand, included segments of 32-bit code (specifically for its built-in hardware drivers), yet its kernel, or the core of the OS itself, was a mixture of 16-bit and 32-bit code. This eased the path of users upgrading from Windows 3.1, allowing them to choose between running their current 16-bit Windows applications or stepping up to faster, more efficient 32-bit programs. This hybrid was in some ways a very smart step, as it enabled many people to move to Windows 95 more or less seamlessly; but it created a problem — the 16/32-bit kernel was nowhere near as powerful as a fully 32-bit kernel.

For one thing, Windows 95 ran out of memory too quickly. Many attempts were made through the life cycle of the Windows 9x operating systems to do something about this, but there were only so many quick-fix solutions that could be applied. The only way to really solve it was to rewrite the entire operating system from the ground up and make it entirely 32-bit.

That led to the creation of Windows NT, which stood for New Technology. And NT was exactly that: a clean break from the 16-bit past of Windows, built bullet-proof for users with high-end hardware and expectations to match.

The release of NT 4.0 in 1996 saw Microsoft graft the familiar Windows 95 interface onto the industrial-strength framework of NT. By this time the majority of drivers and applications were fully 32-bit, and provided they weren't games or other complicated multimedia programs, they could run happily on both Windows NT and Windows 9x. At this point, some savvy users were already moving to Windows NT 4.0. But NT demanded relatively lofty system requirements, not least of which was a minimum 32Mb of memory.

Today, with most computers shipping with 128Mb of RAM and 256Mb sticks selling for as low as $55, memory has almost become a non-issue. But in those days, 16Mb was a hefty ask for many people — and the only version of Windows that would run comfortably on 16Mb was Windows 9x. Even if you ramped up to 32Mb of RAM, the physical limitations of the OS would soon kick in.

Microsoft made no secret of its desire to move to a single 32-bit OS. Twice it announced that Windows 9x had reached the end of the line. Twice it relented: first with the release of Windows 98 Second Edition (SE), then with Windows Me (unkindly but accurately tagged 'Windows 98 Third Edition'). It's undeniable that the hybrid 16/32-bit kernel was kept alive long after its relevance was exhausted. But the success of Windows 9x meant that there were millions of users whom Microsoft could not afford to alienate, unless corporate suicide was part of their marketing plan.

When Windows 2000 (the successor to NT 4.0) rolled out in February 2000, it presented a very attractive case. PC power

Notes to Consolidated Financial Statements (in thousands except share and per share data)

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The new Start button consolidates a lot of the functionality that used to be scattered across the desktop, and adds new features like the list of recently used programs (left).

was cheaper than ever, and Windows 2000 offered so much more than any of its predecessors that the 128Mb requirement made a lot more sense.

Which brings us to Windows XP. For some time, Microsoft had been planning to deliver a stripped-down version of Windows 2000 to consumers (even the product's official name, 'Windows 2000 Professional', implied to some that a 'Personal' edition was on the cards). However, as computer hardware strode ahead, it became clear that Microsoft didn't need to trim back the OS nearly as much as hoped (or feared), and the single unified Windows was finally within reach, albeit in two flavours: a Home Edition for people upgrading from Windows 9x and Me installations, and a Professional Edition for the NT/2000 users, with advanced features not required by home PCs.

Windows XP's new look is spiffier and more suave than ever before, but it is also more functional. Explorer windows now have task-based information that changes depending on what you're working with.

Windows XP brings plenty of new features to the table, but also borrows (and often improves upon) components of 9x and 2000. System Restore, which takes a snapshot of your PC's device drivers and system settings so you can roll things back to a previous working configuration in the event of PC problems, was inherited from Windows Me. Windows NT has something similar to this — called, not surprisingly, the Last Known Good Configuration — but in an extremely limited form. System Restore is a superb escape hatch for the type of advanced users who currently use Windows 2000, as they're often loading new drivers and modifying their system configuration

Meanwhile, home users of 9x can experience the advanced support for multiple languages, including Eastern and right-to-left character sets, introduced in Windows 2000.

I do a lot of Web browsing in Japanese, and in XP, all I have to do is press Alt and the left Shift key to switch the keyboard into Japanese mode if I want to fill in forms or use programs that support Unicode input (such as Word or Internet Explorer 6). This isn't limited to input, either. If I obtain a program written for another language, I'll be able to run it seamlessly, with full display support.

The features specifically written for Windows XP centre a great deal around the experience the user has with the OS (Microsoft's justification for the XP moniker). A lot of this comes down to changes in the interface that make the OS easier to work with, more versatile, or preferably both at the same time. Also, whenever a change has been implemented, you have the discretion of modifying it or turning it off completely. Many people find the interface changes capricious or annoying, rather than helpful.

A NEW START

The key elements of the interface itself have been redesigned, adding puffy 3D buttons to dialog boxes and rounded corners to windows. The overall effect is more pleasing than the squared-off, grey-on-grey look we've all got used to. Of course, the colour scheme is customisable, and Microsoft (along with other companies) will later be offering 'Theme Packs' that change the whole look of the OS to suit your whim.

The Start button has been completely reworked. It's now a two-column menu instead of the 'everything in one column' layout of before. The left side of the column contains two lists. At the top is a set of programs that can be customised. Two of these spots are reserved for your email program and Web browser (again, both can be changed by the user), but you can specify more commonly used programs. Below that, under a divider, are the six most recently launched applications. This way, as you work, the most commonly used apps 'bubble up' into the list and stay there, always within reach.

The right-hand column contains the icons that formerly populated the desktop — My Computer, My Network Places, and so on (the only icon remaining on the desktop by default is the Recycle Bin). If you right-click on these icons you can change their properties, and have them return to the desktop if you choose.

I actually like having them in the Start button — that way I don't have to go rooting around for them on the desktop in the first place. And if over-population of the desktop does become an

issue, XP can conduct a sweep and shift icons that have not been used in the last 60 days into a single folder on the desktop. I also appreciate the return of an old feature — an invisible grid which makes icons automatically 'snap' into position when you move them around.

Other changes abound. The Control Panel can now be presented as a cascading menu in its own right (a great timesaver), and newly-installed software in the Programs submenu are highlighted to set them apart from the regular suspects.

TRAY MAGNIFIQUE

The taskbar and System Tray get that shiny new XP look, plus some shiny new features to boot. If you have multiple windows open for a particular program (such as a series of Word documents), the Task Bar collapses them all into one button. Click on the button and you get a pop-up list of all the windows that application owns.

Another clutter-killer is the Show/Hide Icons setting for the System Tray. When there are more icons in the Tray than it can hold (usually only a couple), the Tray sports a button which can be used to open the Tray to its full size, with all icons visible, or collapse it. If you have a lot of applications and utilities that insist on sticking their icon in the Tray, this is a godsend.

Whenever you open a drive or folder in Explorer — not the Web browser, but the Windows Explorer file manager — the left-hand pane lists tasks that are relevant to whatever folder you're in. If you open a folder containing nothing but images, you get image manipulation and editing links; if it's music, you get links for playing and organising songs. Other links in this side panel let you jump back to the desktop or delve into the network.

Select a file and the buttons change to be file-specific: rename, copy, delete. Another pane displays data on the file, and if that's not enough, there are new views which display image files as large thumbnails (movie clips show the opening scene), plus a filmstrip view for picture folders that gives a large display of the selected image plus a gallery of the rest.

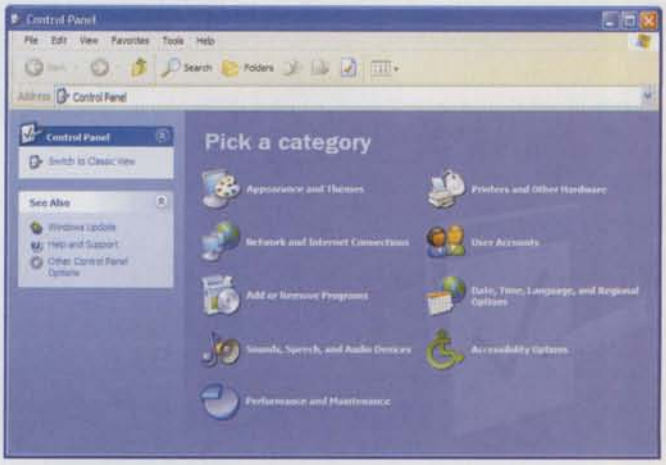
The Control Panel gets a similar task-oriented makeover. The initial welter of icons is replaced by nine basic categories — Appearance and Themes, Performance and Maintenance, and so on. Within those categories are the relevant icons as well as tasks, such as 'Choose a screen saver' or 'Free up space on your hard disk'. If you are used to the old layout and you don't want to mess with a good thing, then you can just swap back to the conventional icon view.

AS YOU LIKE IT

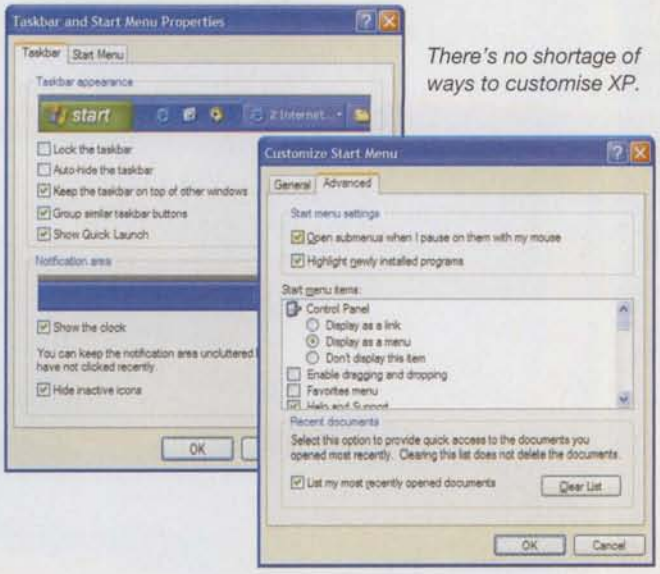
Perhaps the best thing about the new Windows XP interface is how much it *can* be modified. There's almost nothing you have to settle for, apart from the size of the Task Bar and Start button at the foot of the screen (and they *do* take some getting used to).

If you see something you don't particularly fancy, change it, or turn it off altogether. XP has a rich degree of 'discoverability': just poking around a little, looking here and clicking there, reveals new stuff to play with.

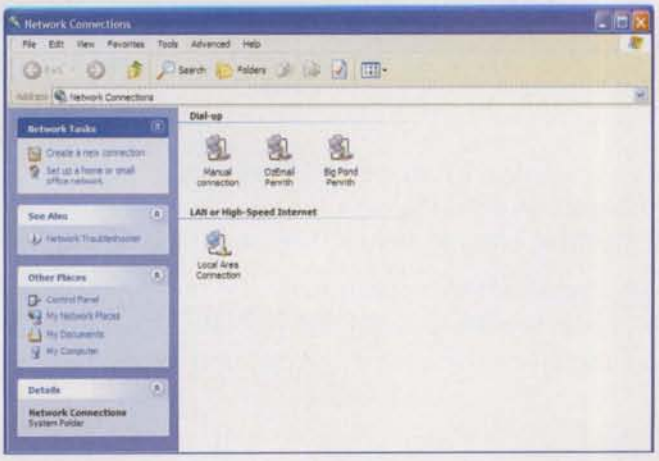
And that's the key to the whole experience (there's that word again). The more time you spend with Windows XP, the more we think you'll like it.



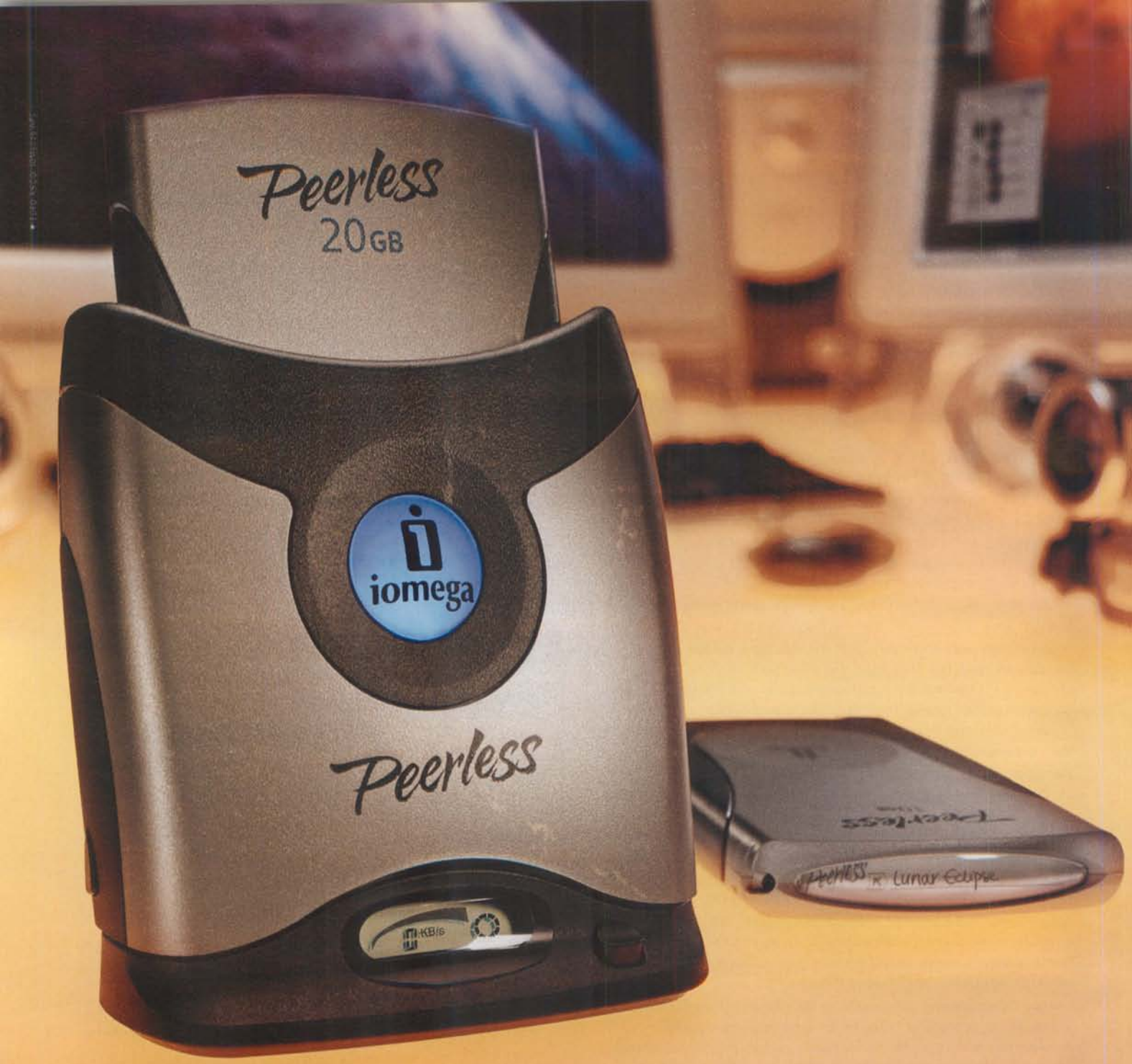
The new look of the Control Panel is divided into categories and tasks, but you can always switch back to the cluttered classic layout.



There's no shortage of ways to customise XP.



Improved networking in XP, with more task-oriented helpers.



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The Internet

BROWSING IS PASSÉ — GET READY FOR AN OS THAT'S CHAT-CENTRIC, AS MICROSOFT'S INTERNET DIRECTION CHANGES TACK WITH WINDOWS XP.

If we asked you to name the centerpiece Internet application in Windows XP, you'd almost certainly answer 'Internet Explorer', the browser that's been welded to the OS since Windows 98.

And you'd be wrong. We're convinced that the browser has had its day in the sun. IE all but owns the market and has made relatively few significant advances since version 4. It's gotten faster, prettier, steadier on its feet. It's bowed to more Web standards. It's finessed the interface with user-friendly touches. But the stratospheric growth of instant messaging, which gets back to the concept of people communicating with one another, signals the next wave, and Microsoft plans to repeat its Internet Explorer victory with Windows Messenger.

Windows Messenger is a turbocharged version of the MSN Messenger chat application. Its main benefit to Microsoft is that it requires you to sign up to its Passport identification service, which is a cornerstone of its planned array of .NET services.

On the surface, the changes from MSN Messenger seem restricted to a splash of XP's high-gloss paint. But just like an iceberg, the big stuff is beneath the surface. This includes Net-based phone calls, for which Microsoft is expected to partner with a major Australian telecommunications carrier; audio chat of surprising clarity; application sharing and doodling on a shared 'virtual whiteboard'; and video conferencing, if you've got an XP-compliant Webcam attached to your PC (although users of Windows Messenger can't do video sessions with MSN Messenger users).

All of these features come into their own when XP is hooked into a fast full-time connection such as cable or ADSL.

JUST BROWSING

Back on the browser side, Internet Explorer 6 (also available as a separate download for Windows 9x, NT and 2000) is an underwhelming effort. We were most impressed by the shrink-to-fit button, which resizes large JPG images on a Web page to fit inside the browser window; and the increased control over cookies, including the ability to choose whether to accept or reject cookies, to block all 'third-party' cookies (sent by advertisers) and to remember your preferences from one site to the next.

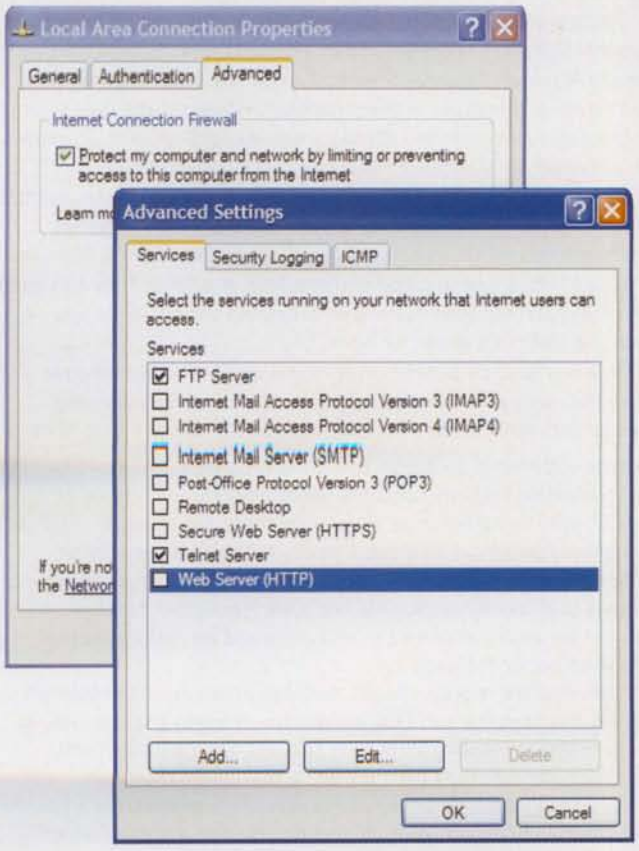
The new Media Bar plays streaming audio and video from Microsoft's WindowsMedia.com site within a pane down the left side of the browser. IE6 also integrates with Windows Messenger, which gets its own toolbar icon and is automatically launched when you start Windows (to disable this, open Messenger's Tools, Options dialog).

Java is missing, in place of Microsoft's own ActiveX, but the engine can be downloaded as needed; and IE6 now supports the P3P privacy policy, although there are questions concerning how effective this standard is.

The Outlook Express 6.0 emailer sees enhanced security by optional blocking of file attachments (the most common virus delivery mechanism) and warning of programs that try to access the address book or send email from your system.

Another move to keep the nasties at bay is the introduction of a firewall built into the OS. The Internet Connection Firewall (to give it its full name) blocks ports from inbound probes, with easy configuration for selecting which services (FTP, Telnet, HTTP and so on) and ICMP requests should pass through the firewall.

You can't stop outbound calls from Trojans that have snuck onto your system and attempted to pass control over to a wily hacker. For maximum security, we suggest you install a third-party firewall such as ZoneAlarm or Norton Personal Firewall 2002, both of which have been upgraded to work with Windows XP.



XP's inbuilt firewall provides essential port blocking services and good configurability, but it's not going to replace a full-strength firewall such as ZoneAlarm.

Help

HELP YOURSELF, OR ASK A FRIEND TO HOP BEHIND THE WHEEL AND HELP YOU OUT OF TROUBLE – BOTH ARE POSSIBLE IN WINDOWS XP.

Continuing a trend in recent versions of Windows, XP's Help system is more Web-like than ever before. The main Help hub has browser-like controls and buttons, even letting you bookmark frequently used help pages and topics in a special favourites list. It sensibly divides the content into topics and tasks, and although advanced users might find it frustrating having to click their way through several layers to reach the content, average users benefit enormously if they're looking for a solution to a problem that they might not know how to define.

It's also liberally sprinkled with links to Microsoft's Web site and newsgroups, which it calls 'Windows Web site forums' (although if you're behind a locked-down corporate firewall you might find access to newsgroup servers unavailable).

There are oddities, too. One page, which spruiks "the Microsoft Personal Support Center Web site", advises that "the first time you use the Microsoft Personal Support Center site, you must register your name and address in the database". However, the only links on the page took us to the standard KnowledgeBase and, strangely, the Windows 2000 support site!

XP's most innovative hand-holding feature is Remote Assistance, which is based on Windows 2000 Terminal Services and allows another Windows XP user to view your screen on their PC and use Windows Messenger to guide you one step at a time. They can even take full control of your system for a defined period, while you sit back and watch an expert at work.

This has obvious benefits in personal and business helpdesk scenarios; we can see Remote Assistance becoming especially popular with *APC* readers who are often called upon to help their parents and friends fix niggly computer problems.

To alleviate security concerns about offering any degree of remote control, XP enforces several stages in the request-authenticate-approve process. Remote assistance can only be initiated by the person seeking help, by issuing a remote assistance request to a specific person via Windows Messenger or email. This includes an expiry date for the invitation and an optional access password set by the user.

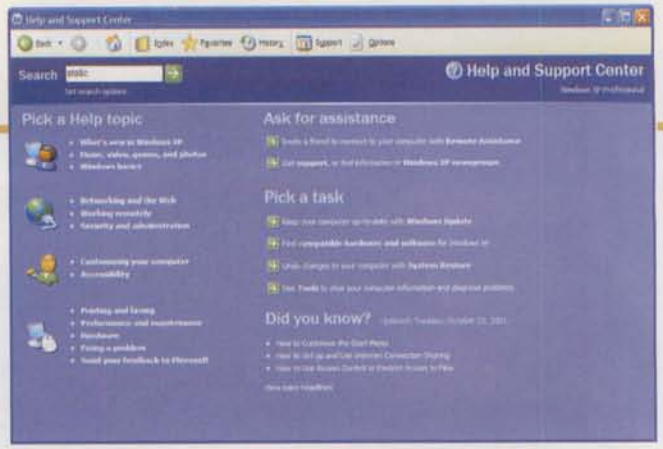
The recipient clicks a special message attachment to establish the link between the two PCs, which then requires the first user to approve the connection from their PC. The other person must always be invited: they can't initiate a session on their own.

The main limitation of remote assistance is that it uses a specific port (port 3389) and if your PC is sitting behind a firewall which blocks this port, or uses a Network Address Translation router, remote assistance won't be possible.

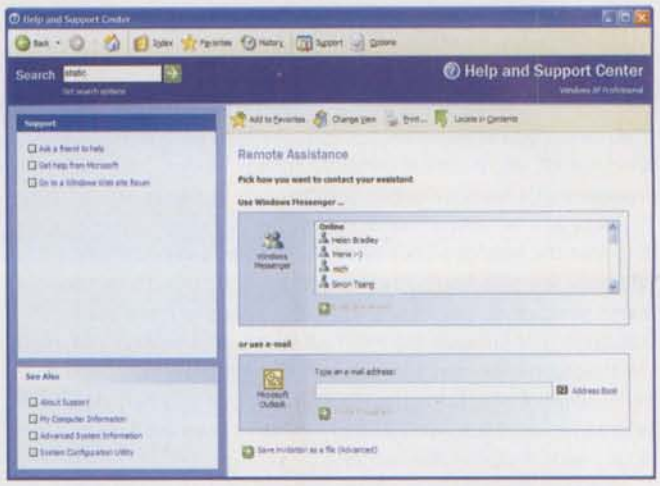
Also, as invitations are tied to the IP address of the machine requesting assistance, people with dialup modem access who make a call for help, log off and then come back online later may receive a different IP address (if their ISP uses dynamically-allocated addressing), so the invitation won't work.

An extension of this remote control is Remote Desktop, which is available only in XP Professional. It allows complete access to your PC no matter where you are in the world, just as if you were sitting in front of the machine. Remote desktop is password-protected and disabled by default; it can only be activated by adding the Group Policy snap-in to the management console.

While not as feature rich as products such as Symantec's PCAnywhere, this offers more than enough functionality and security.



The revamped Help system simplifies troubleshooting and provides an easy path to changing XP's array of settings.



Need a hand? Remote Assistance lets you ask a friend to step in and show you what to do; with your permission, they can even take control of your PC.

Remote Desktop isn't as powerful as commercial solutions such as PCAnywhere, but provides enough to easily access the desktop of another machine over the Web.

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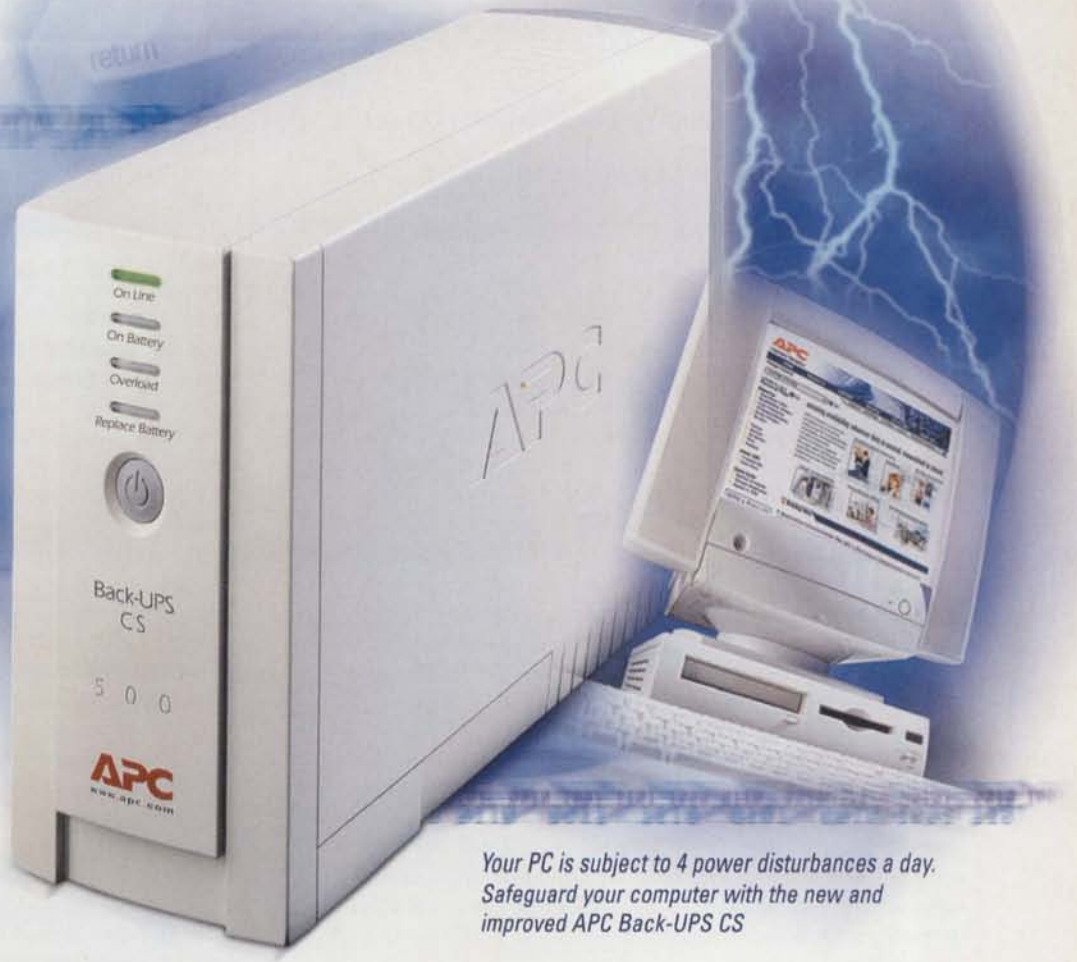

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Digital media

THE WINDOWS MEDIA PLAYER IS XP'S HUB FOR ALL THINGS MULTIMEDIA. IT PLAYS, IT STREAMS, IT CATALOGUES, IT RIPS ANDS IT BURNS. SO WHY DOESN'T IT DO MP3?

What Internet Explorer is to the Web, so Windows Media Player 8 is to digital media. It's faster, slicker, more capable and better behaved than the Windows Media Payer 7. But unlike IE, you can only get WMP8 in Windows XP — users of Windows 9x and 2000 will have to make do with WMP7.

This alone indicates how heavily WMP8 is tied into the OS. It's an all-in-one media tool worthy of Joe the Gadget Man: it plays CDs, local and streaming audio and video files, tunes into Net radio, rips audio CDs to digital music tracks and back again, and can even play DVDs.

And it does them very well, using the DirectX 8 engine for superior handling of multiple video and audio streams — essential for DVD playback, which is bandwidth-intensive for the CPU and system bus.

The one tool that's missing is MP3 recording. WMP plays MP3 tracks with the same panache as its native Windows Media Audio format — although the revised WMA8 codec produced equal clarity with file sizes half those of MP3, so you can fit twice the music on your digital audio player (provided it supports WMA). And you can add artist and album names, song titles and even lyrics using standard ID3 metadata tags, which are exposed as editable objects through the File Properties dialog box.

Once a disc is inserted into Windows Media Player 8, album art and track titles are automatically downloaded if they're online. The same goes for DVDs.

Choose to rip an audio CD, however, and it's WMA all the way. The earlier betas of XP allowed MP3 recording at a paltry 64Kbps, equivalent to the flatness of AM radio, but in the final code MP3 went MIA.

Microsoft's concession to MP3 lovers was to design WMP8 with a plug-in architecture, with third-party vendors Cyberlink, Intervideo and Ravisent authorised to sell WMP plug-ins (for $20 to $40) that enable MP3 ripping at up to CD-quality 192Kbps.

Our suggestion? If you want the best quality for file size, and if your digital audio player supports it, go with WMA. If you want to rip MP3, download the RealJukebox or MusicMatch freebies.

You'll also want to grab RealPlayer while you're at it, because WMP8 can't stream RealAudio or RealVideo signals, which remain very popular online (especially for Net radio). And despite dire warnings that you're about to install rogue software which had not passed the Microsoft test and could 'destabilise the system', WMP8 works fine with the DivX 3.11alpha codec.

Media Player 8 also allows DVD playback, although you first must have either a hardware or software DVD decoder loaded — just owning a DVD drive isn't enough. If you don't have an encoder, these will also be available as plug-ins. It's an annoying limitation, but not a crippling one.

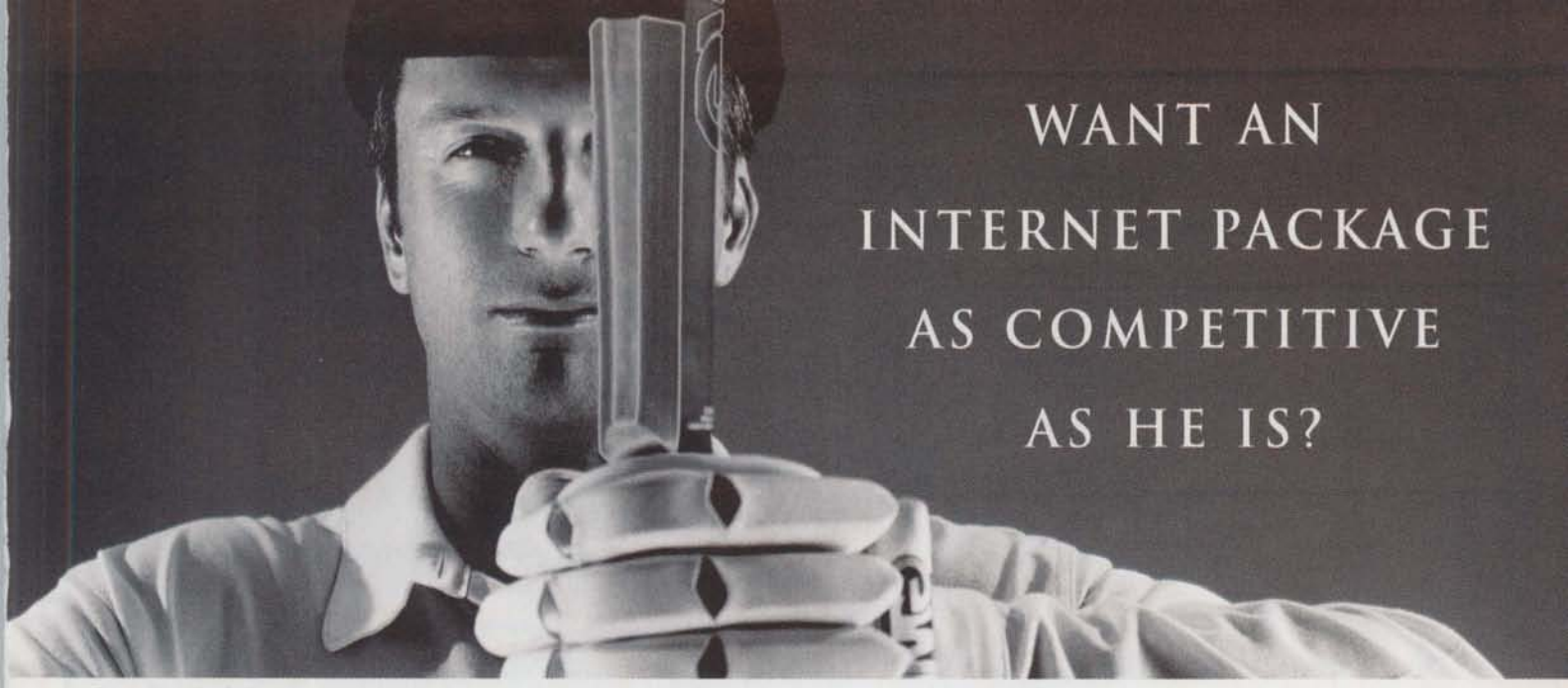
Playback quality depends on the codec you have installed, and WMP8 sports many of the same features as dedicated DVD software, including a lush full-screen mode and access to DVD movie chapters.

Windows Movie Maker remains the poor cousin to Apple's iMovie, hampered by its clumsy interface, lack of creative control and inability to output to tape. Tighter video compression counts for something — we crammed a 30-minute video into just under 40Mb at 320 x 240 resolution, and the results were quite watchable. You can also wok with uncompressed AVI files at 720 x 480 resolution.

Burning audio CDs from WMA and MP3 files (or creating data CDs, for that matter) can now be done at the highest rate of your CD-RW drive, instead of being pegged to the 2x limit of WMP7. And the integration of CD burning into XP's interface is a prime example of seamless integration.

Windows lets you send files or folders to a temporary holding area, which represents the blank CD in your CD-RW drive. You can add or remove files and directories as often as required. When you're done, one click of a button and XP sends this image to the CD burner.

Does this mean you can throw away your copy of Easy CD Creator? You certainly won't be able to use it without an upgrade, as this turns out to be one of the programs that's incompatible with Windows XP, at least until Roxio releases an update. In future, third-party CD programs will need to do a lot more in order to beat Windows XP. Right now, the only advantage they offer is the ability to make a bootable, mixed-mode data and audio CD, and to print pretty jewel case inserts. For most of us, that means Windows XP will do very nicely on its own.



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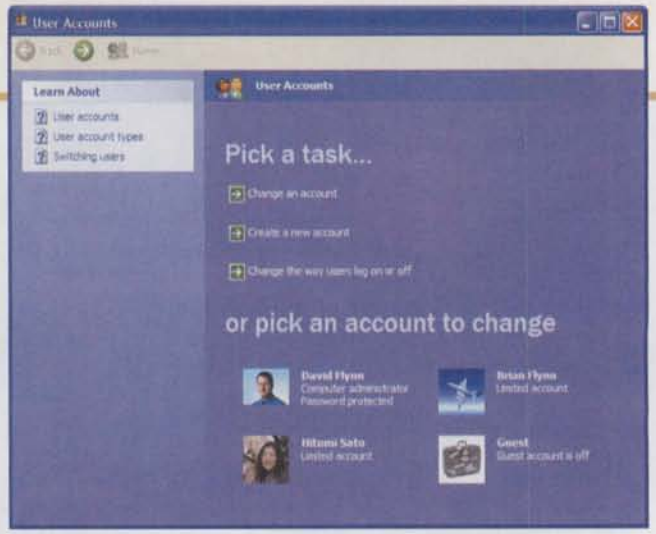
XP for home

IF XP HAS BEEN BUILT FOR ANY ONE GROUP OF USERS, IT'S THE AVERAGE FOLK. THE MUMS AND DADS, THE GRANDPARENTS, EVEN THE TWENTY AND THIRTYSOMETHINGS WHO DON'T WANT THEIR COMPUTER TO GET IN THE WAY.



Sharing your PC between several people? XP makes it easy to set up user accounts.

The improved home networking wizard walks you through setting up a shared Net connection, activating the new Windows firewall, and enabling shared folders and printers between PCs.

The majority of home users don't want to think about their computer. They don't even want to think about Windows. They just want things to work.

They want to plug in a digital camera so they can edit, print or email the pictures. They want to share one computer without each other's work getting in the way. They want to connect two computers so they can share an Internet connection. They want to surf, chat, type, play games, listen to music.

They, more than anyone else, are the people who'll be wooed, wowed and won by Windows XP.

Luckily, Microsoft has managed to ensure that the power users — the geeks, the professional consumers or 'prosumers', the heavy-hitters of the home computing scene — find plenty to keep them busy under the bonnet. Most of the wizards can be sidestepped. All of the eye-candy can be turned off. But the key drawcards remain a solid attraction.

Homes with a single, shared computer will benefit from the easy way XP can be set up for multiple users. Windows 9x went part of the way by permitting personalised desktop settings. XP goes the whole nine yards by helping you configure the PC for each user, down to saving their preferences, My Documents folder and bookmarks; then using Windows 2000's bullet-proof security and NT file system (NTFS) to retain your settings and shield your documents from prying eyes.

Provided your PC has enough memory (we suggest at least 128Mb), try XP's Fast User Switching, which lets one user step away from the PC yet remain logged in, while another gets down to work. The first user's session is suspended — with all applications open, files and email being downloaded and even music playing — until they log back in again. There's no need to go through the full Logoff routine, which in Windows 9x was often little faster than a complete reboot (in fact, the XP shortcut of Win+L lets you switch users in mere seconds).

By default, XP assigns to the first account the all-powerful privileges of the administrator, and can also activate a limited-access guest account for occasional users. Additional users can get their own limited account.

How programs are exposed to these users is another matter. Obviously, the administrator can load and run anything, but Microsoft cautions that limited accounts may have trouble loading or running software which can't deal with multiple user profiles. Some programs are very well behaved: Norton Utilities 2002, for example, asked if we wanted it to be accessible to all users or just the current user. Others could only be available to every user. If you want to keep some of your programs invisible to the kids, experimentation with a test account is highly recommended.

The Network Setup Wizard helps connect PCs, regardless of their version of Windows, and kicks off with a great checklist for planning and assembling your network. We easily set up several networks using both Ethernet and wireless, including a combined system where XP's 'network bridging' let us connect to the Internet via an Ethernet cable modem, but share Net access with other PCs through an 802.11 card. The only roadblock was a USB 802.11 hub, for which XP had no drivers and the Windows 2000 drivers failed to work.

Home users can surf safer too, thanks to a new firewall (see page 63) that's activated when you create a network.

Like Windows Me, Windows XP incorporates System Restore, which enables you to step back from a system crash or a bad experience with software and restore your PC to a previous all-systems-go state without losing data. In addition, XP's device driver rollback feature can revert to a previous version of a driver should something go wrong during updating.

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Microsoft Windows xp

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XP for business

SMALL BUSINESS USERS NEED TO BE ESPECIALLY MINDFUL OF THE COSTS OF UPGRADING TO WINDOWS XP, BOTH FINANCIAL AND PRACTICAL, AND MAKE SURE THAT THE BENEFITS TRANSLATE INTO IMPROVED PRODUCTIVITY.

The quickest test of whether XP will help you get down to business is if your staff are currently using Windows 9x and waste time rebooting their machines several times a day.

If that's the scene at your office, XP is worth a close look, provided your hardware is up to the task. Upgrading your hardware, as well as the licence costs for one version of XP per computer, will determine how much money you're willing to spend to defeat any shortcomings of Windows 9x.

Our advice is to budget for some hardware replacement as not all video cards, network cards and even systems will take kindly to the upgrade. Even if your present hardware runs Windows 9x perfectly, there's no guarantee that the friendship will extend to XP. We found that out the hard way when we attempted to upgrade one of our lab boxes from Windows Me and discovered that XP kept on crashing because the motherboard was not up to scratch.

If you're running Windows 2000 your hardware is probably sufficient for Windows XP but the need may not be so critical.

One of the reasons that many small businesses have remained with 9x is because of poor driver support under Windows NT and to a lesser extent Windows 2000. XP handles older legacy hardware such as printers with little difficulty, but it does require current XP drivers for each and every peripheral. If you are using a piece of legacy hardware such as a barcode scanner or POS terminal that ships only with a 9x driver, you could be out of luck, because XP uses a different driver model to 9x. On the other hand, most (but not all) Windows 2000 drivers are supported.

Windows XP does a reasonably good job of supporting legacy software as numerous compatibility patches are provided with the system. Provided the software doesn't make undocumented calls to the operating system or attempts to access the hardware directly there are few problems, particularly since most business software has been rewritten and cleaned up over the last two years to make it GST and Y2K compliant.

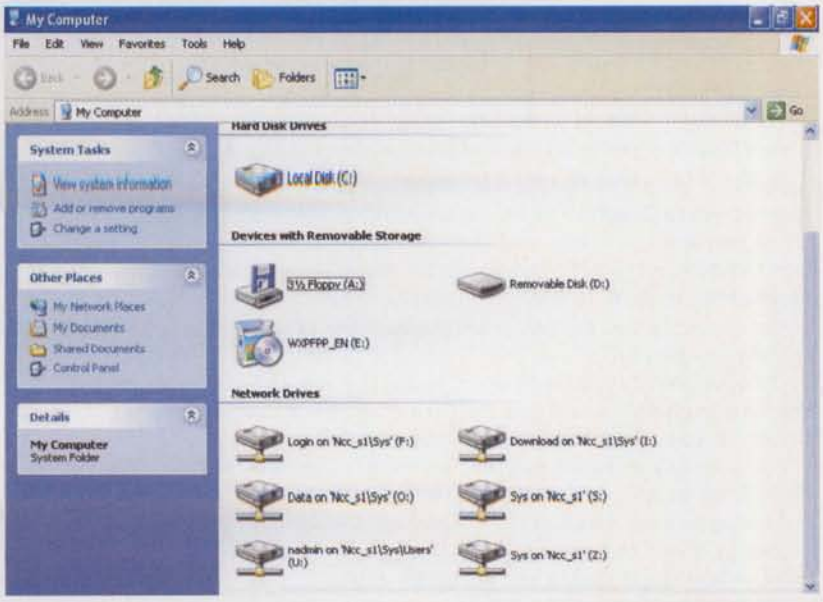
The main business benefits of upgrading to XP from 9x are the stronger security, the improved ability to lock down the desktop (keeping tinkerers under control) and inbuilt remote access for support to staff in distant offices, as well as dialling into your own desktop when you're on the road. The system is also considerably easier to configure for Ethernet networks, wireless LANs and Virtual Private Networks.

But unless you're very familiar with network design and computer hardware, you should either engage a computer consultant or work closely with your reseller (if they have the required expertise) to plan the upgrade.

While XP works well out of the box, there are a few traps that can be avoided with a little planning and experience, particularly if you already have a server or need to support more than a handful of computers.

Connecting XP to an existing network is quite easy as XP automatically discovers existing NT machines and Novell servers, provided you choose the custom install to load the client for NetWare. XP automatically allocated itself an IP address from our DHCP server and detected an ADSL Internet router: an improvement over 9x and NT but nothing new for Windows 2000 users.

If you're presently running Windows 9x and are prepared to shell out for software and hardware upgrades, the stability and security of XP are worth stepping up to. If you're still on Windows NT and want the snazzy interface, easier administration and better support for current technology, XP is also a goer. However, businesses on Windows 2000 will probably find they've got most of what they need.



Connecting the network was very easy as XP automatically detected NT machines and had no difficulty logging onto our NetWare server.

XP for notebooks

WINDOWS 9X HAS THE HARDWARE SUPPORT, WINDOWS 2000 HAS THE PERFORMANCE. NOW NOTEBOOK USERS DON'T HAVE TO CHOOSE: XP'S GOT BOTH. BUT IT'S NOT A MUST-HAVE FOR THE MOBILE SET.

Deciding which OS to load on your notebook used to be a toss of the coin, and regardless of the result many people didn't feel they'd won. Despite sometime patchy handling of standby and hibernate routines, Windows 9x supported a broader range of hardware and software than Windows 2000.

Windows 2000 had the edge for speed and stability, but it took time for ample hardware drivers to become available, and the hefty processor and memory requirements were beyond many laptop users.

As you'd expect, Windows XP boasts the best features of both strains of Windows, making it the ideal notebook OS. And it packs a few tweaks that will make life more bearable for everyone from road warriors to corridor cruisers.

But it's no bold step forward for the mostly mobile class. If you're already contemplating an OS upgrade or a new notebook, XP is the only path to tread. Otherwise, you can stick with 9x or 2000.

The most immediate gain from XP is Microsoft's new ClearType font-smoothing technology, which alters the way pixels are painted onto LCD screens to effectively triple the perceived resolution. The result is smoother, jaggie-free fonts which appear to have a soft shadow behind them.

ClearType is disabled by default — to activate it, run the Control Panel's Display applet and click the Effects button on the Appearance tab. However, our tests indicate that not all notebooks respond well to ClearType and it slightly slows display rendering.

XP also has a solid grip on power management, taping into the latest version of the ACPI (Advanced Computer Power Interface) specification to perform advanced tricks such as turning off power to specific devices and throttling back the CPU speed to conserve battery life.

XP's hibernation routine — which copies the entire contents of the notebook's RAM to a file on the hard drive before powering off the PC, so you can restart the PC and pick up exactly where you left off without the tedium of a lengthy reboot — proved two to three times as fast as Windows 2000 in suspend-to-disk and resume operations. Likewise, XP notebooks — especially new models built with the latest BIOS and ACPI support — enjoy substantially faster startup and shutdown times.

While infrared seems all but dead in the water, there's an interesting Wireless Link option for using IR to transfer pictures from a digital camera into a special folder on the notebook, and to open that folder whenever new images arrive.

Wireless networking is The Next Big Thing for mobile computing, and most top-tier vendors now offer notebooks with built-in 802.11.

XP's wireless win is 'zero configuration' — it automatically scans for the local 802.11 wireless network. And unlike Windows 2000, which spat the dummy when wireless access was interrupted, Windows XP reconfigures itself on the fly and without rebooting as you move from one cell to the next. It seamlessly reconnects services over the newly available channels and if necessary, switches from static to DHCP-based configurations. XP is also smart enough to handle simultaneous Ethernet and wireless network connections.

Bluetooth is another matter. Microsoft decided against building Bluetooth support into the final code of Windows XP. While we're certain this will be added at a later stage (that's what the Windows Update site is there for, after all), for now we face the potential chaos of each hardware vendor providing their own network adaptors and protocol drivers rather than rely on common XP code.

NOTEBOOKS TAKE NOTE

Upgrading your notebook from 9x or 2000 to XP? Here are a few things to keep in mind.

- XP demands more space than any previous version of Windows. Do your sums before you hit that Setup button. If your notebook's hard drive is already elbow-room only, you might want to think about wiping everything clean and starting over, rather than trying to fit XP on top of the detritus of your current OS.

- XP supports most hardware very well but some not at all. Make a full inventory of everything in your system, use the Windows Upgrade Advisor (on this month's CD set) and check the HCL (Hardware Compatibility List) to see if what you have is supported. This goes for desktop PCs as well, but with laptops it's doubly important, since you don't always have the chance of swapping out items (like your video card or onboard sound system) that aren't properly supported.

- XP needs the most recent revision of your motherboard BIOS. Again, this applies to any PC, but with laptops there's a far greater need for an up-to-date BIOS since the power management and device enumeration systems depend heavily on it.

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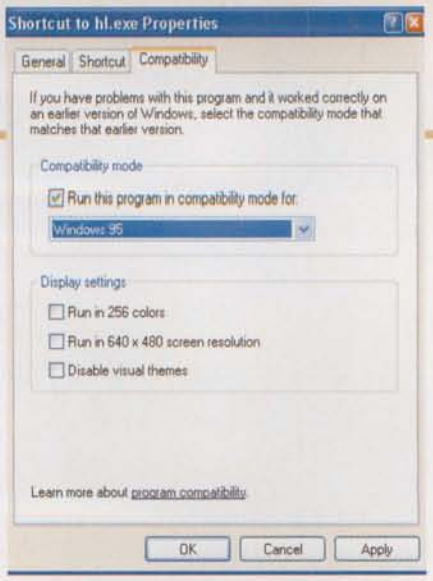
XP for games

SURE, THE INTERFACE IS PRETTY, AND THE NEW FEATURES ARE COOL. BUT HOW GOOD IS XP FOR GAMERS? THE ANSWER: GOOD ENOUGH TO BE *THE* GAMING PLATFORM.



XP's compatibility mode lets you run games designed for previous versions of Windows.

XP is game for anything. The inherent stability in the Windows NT/2000 code base is a tremendous bonus. Previously, a crashed game would freeze your machine and a reboot (both time consuming and annoying) would be required.

In XP, however, just tap Ctrl-Alt-Del to bring up the Task Manager, select the misbehaving game, and zap it. Then you're back at the desktop, where you can try the game again — perhaps after reducing your aggressive video overclocking settings just a little!

Another boon is the extensive hardware support. Windows XP includes up-to-date, Microsoft-certified drivers for just about every 3D accelerator and soundcard on the market. With the very latest version 8.1 of DirectX built in, it's possible to install XP and start fragging right out of the box. We like this!

But don't rely on the Microsoft certified drivers if you want to maximise your performance. They're extremely handy to get you started, but gamers who want to wring the most out of their PCs should download the latest drivers, at least for their video and sound subsystems.

So, how does XP hold up for raw gaming speed? The overheads of its complex Windows 2000-based core and inherent multitasking makes it slower than Windows 9x for games when you're short of memory, but the difference is marginal. Tested on a 1.4GHz Athlon GeForce 3 system, having installed the latest nVidia Detonator XP 21.81 drivers, XP scored just 150 marks less than Windows 98SE in 3DMark2001. It's a tiny trade-off for the extra stability that Windows XP brings to the table.

XP can run just about every game you can toss at it. The only new release we had problems with was Max Payne, which would bomb out before loading a level. This was due to an inherent problem the game has with Windows 2000-based systems, and was fixed by a quick application of the 1.01 patch.

For those with a love for older, 'classic' titles, which might refuse to run when they detect an OS other than Windows 95 or 98, the Compatibility tab found in Shortcut Properties allows XP to present itself as any flavour of Windows, ranging from 95 to 2000. It's a simple piece of trickery that works like a charm, mirroring everything from the way the OS presents itself to the game to creating the authentic Registry keys and strings that the game expects to see. Ultimately, this won't be an issue, because in time all PC games will be designed to run perfectly on XP.

The only real issue is being sure your PC can make the most of what XP offers. Luckily, serious gamers are on solid ground: fast processors, hard drives and ample memory are the order of the day. If you're still making do on a budget machine with a mid-range Celeron and 128Mb of RAM, stick with Windows 98. On its own, XP isn't going to turbo-charge your gaming experience. You'd be better off spending the upgrade price ($237 for Windows XP Home Edition) on some new games or a larger hard drive. For the rest of us — it's time to 'lock and load'!

The popular Half-Life mod Front Line Force in action under XP. Windows is at last a stable and easy-to-configure gaming platform, although XP can be marginally slower than Windows 98. For high-end systems, the trade-off is worth it.

BEYOND DIRECTX 8.1

How can you do better than Windows XP and DirectX 8.1? Try taking DirectX 9 for a spin.

Microsoft is drawing up a list of beta testers to take part in a trial of the DirectX 9.0 beta. The company is after developers and "hard-core gamers" and states that for game enthusiasts, "the application process consists of a series of questions that are required for participation in the beta program". This includes "a list of at least 5 DirectX applications you will use as part of your beta testing of DirectX 9.0".

More information on how to sign up can be found at microsoft.com/directx.

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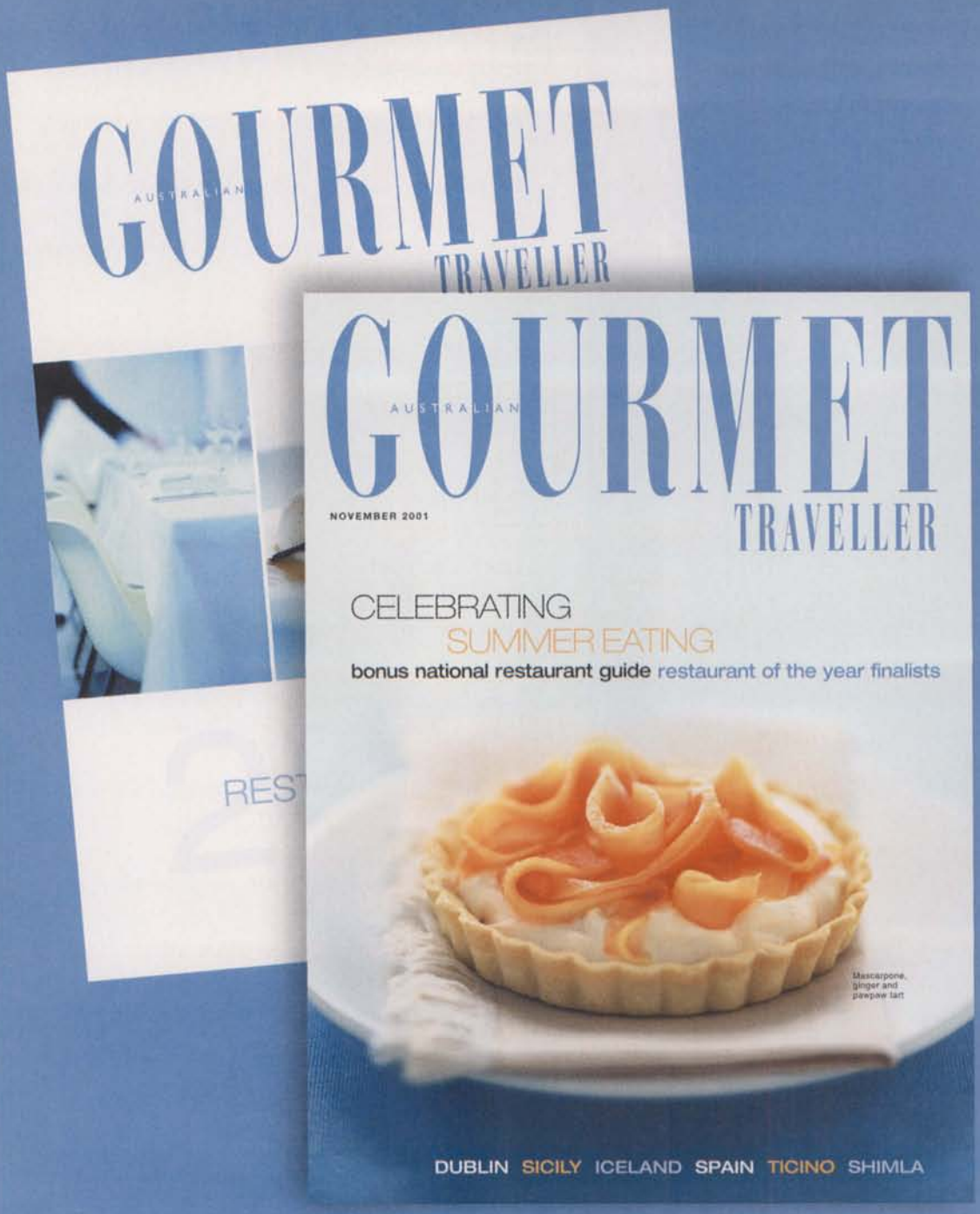

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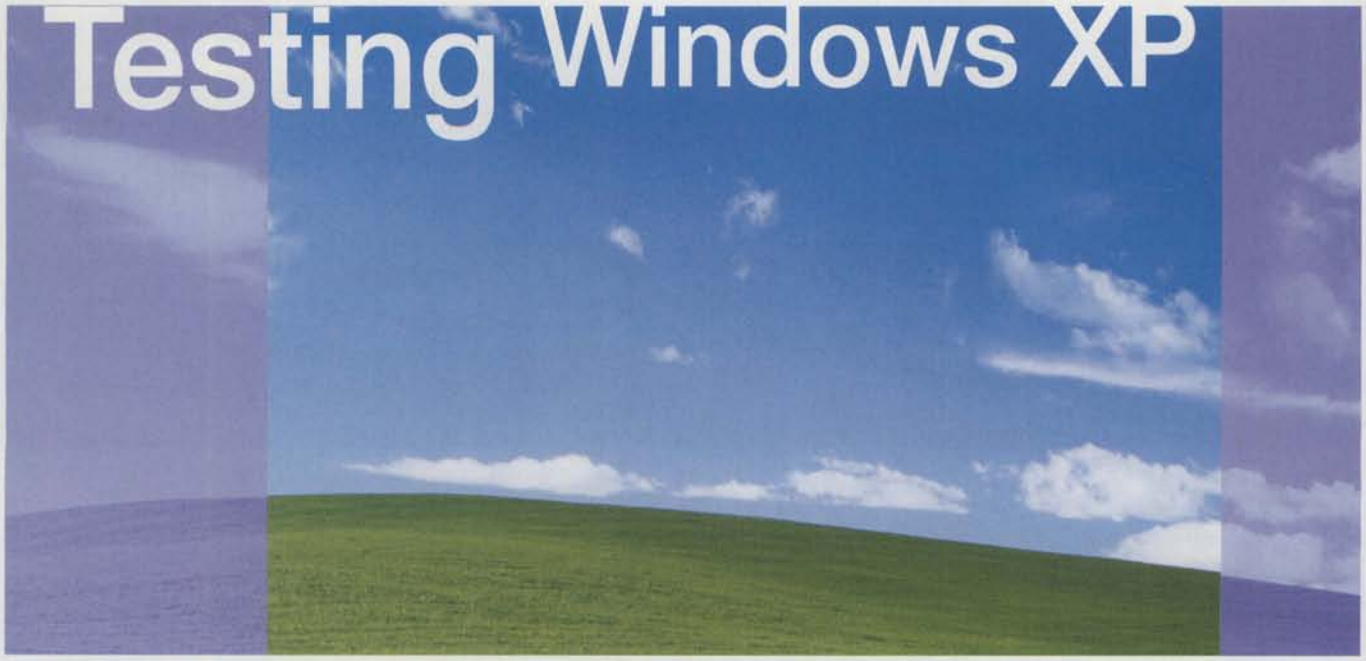
GOURMET TRAVELLER

Testing Windows XP



SURE XP IS USER-FRIENDLY, JAM PACKED WITH FEATURES AND LOOKS FLASH, BUT HOW WELL DOES IT CUT IT IN THE PERFORMANCE ARENA? *APC* LABS TAKES A LOOK AT ITS INNER WORKINGS.

We all know 2000 is the bee's knees for running business applications and that Windows Me is best for playing games, but when these two are merged and advanced into XP what does that mean for system performance?

The other important question is how much RAM is too much? Does adding more RAM increase system performance, and which operating system makes the best use of more RAM?

To answer these questions, we decided to put the various operating systems through their paces with different levels of RAM.

HOW WE TESTED

We used several benchmarking programs in order to assess the performance of XP under a variety of scenarios, and we paid special attention to the way in which XP 'scaled' its results when partnered with additional memory — which is now the cheapest upgrade that you can get.

We tested the operating systems' performance on a Pentium 4 1.8GHz system with an AOpen PA256 Deluxe video card (nVidia GeForce2 GTS GPU) and a 40G ATA100 IBM hard drive. The system's motherboard was based on the new Intel i845 chipset, which is a Pentium 4 chipset with SDRAM (not RDRAM) support. The very latest graphics, chipset and application drivers and patches were installed before benchmarking.

Each of the benchmark tests were performed under the various operating systems with 128Mb of RAM installed. We then retested each OS with 256Mb, then once more with 512Mb.

When it came time to change operating systems, the hard drive was reformatted under each one's preferred file format (NTFS for XP and 2000, FAT32 for Me) and the drivers were updated. The AGP aperture was also modified when more RAM was installed. Aside from the RAM scaling results on page 80, the following results and graphs represent the operating system's performance with 256Mb of RAM.

SURPRISING RESULTS

Did Windows XP turn out to be the uber-OS that trounced all others? It depends on what results you look at. Xp is better at running business applications than Windows Me, but not quite as good as 2000. On the other hand, if you're a gamer, then XP is the operating system of choice, achieving solid scores above the other platforms.

What about adding RAM? Doubling your memory doesn't double your overall system performance, but it can make a difference to the various subsystems. Depending on the OS you're running and the amount of RAM you add, you could find it a costly experiment.

Adding more than 128Mb of RAM to Windows Me only results in significant gains in 3D performance, but 2000 and XP get huge boosts in critical areas such as disk speed — up to 20% with each RAM doubling.

The following performance results are broken into four sections: application, hard drive, graphics and RAM scaling.

DISCLAIMER

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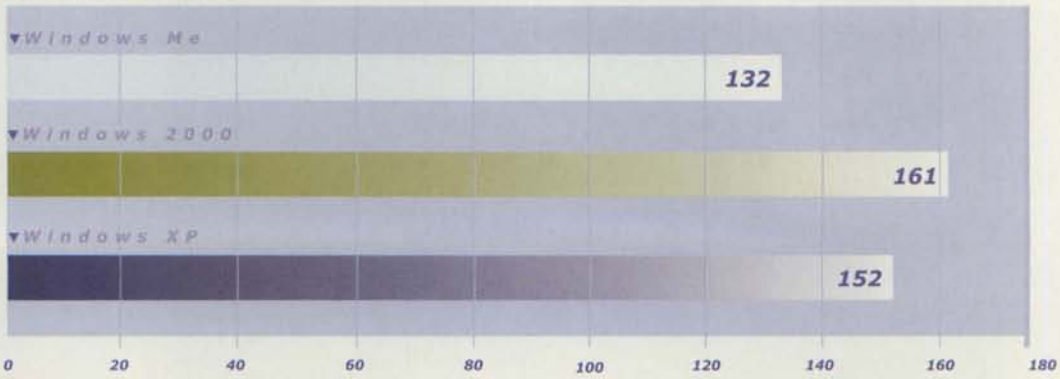
APPLICATIONS

XP is the OS for users who want Windows Me's compatibility with Windows 2000's stability.

Windows 2000 and the NT kernel can be stripped back to bare bones, so running software optimally is not a problem. XP may be based on the same architecture, but it requires more programs running in the background in order to maintain stability. This behind-the-scenes action makes for a slight performance hit in general business applications — so although XP chews through programs faster than Windows Me, it falls a little short of Windows 2000 for sheer running power.

SYSMARK 2001



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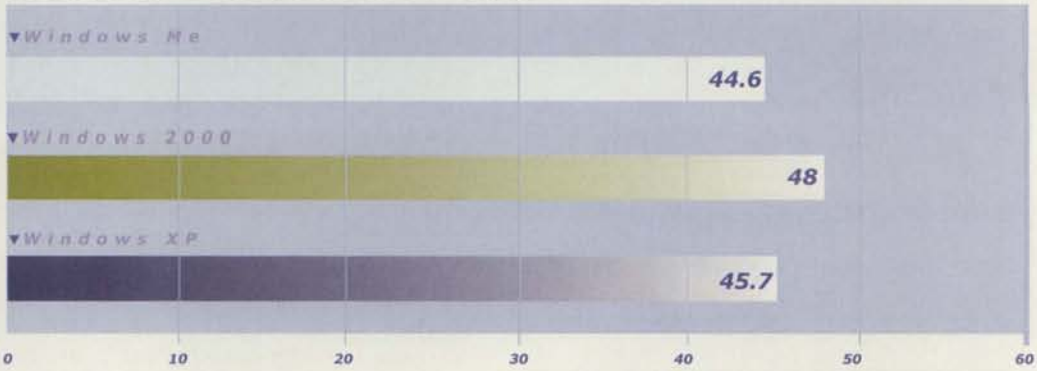
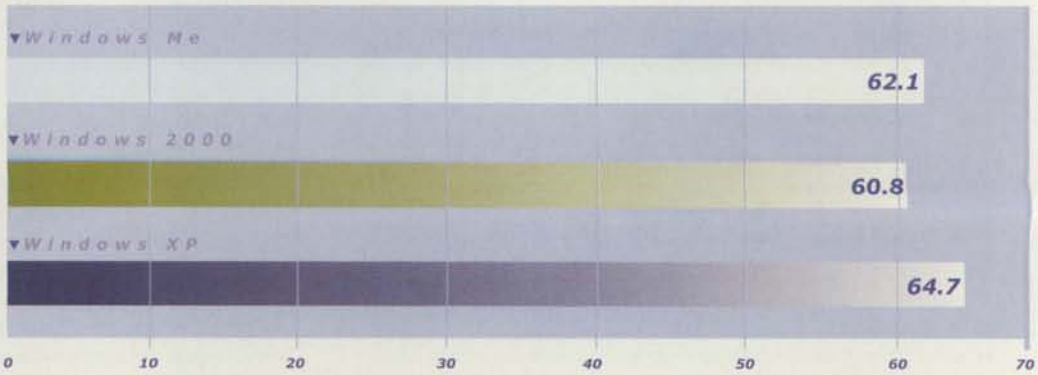


GRAPHICS

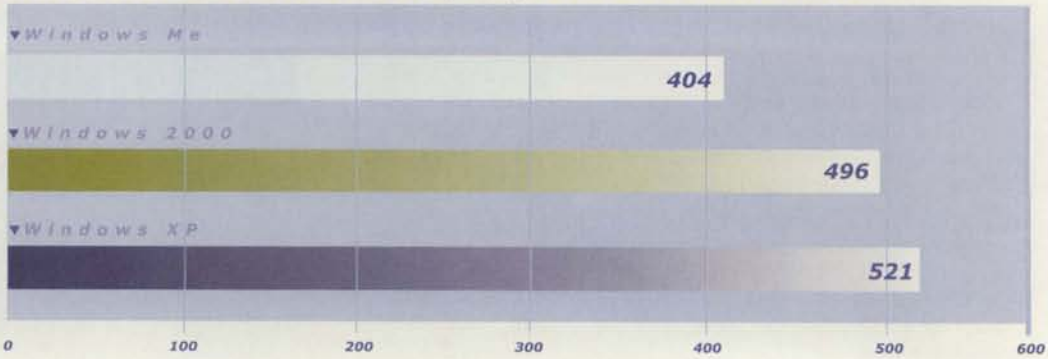
Windows 9x and Me are considered to be the gaming platforms of choice, so it's no mean feat to live up to the performance levels set by that architecture. 2000's Achilles heel has always been that its gaming support from the industry and 3D graphics capabilities have taken a backseat to other operating systems. XP looks set to break that stranglehold.

It outperformed the other OSes in the Quake 3 benchmarks, where we had maxed out the details in the game and set the resolution to its highest. It even surpassed Windows 2000 in 2D processing, and utterly trounced Windows Me.

QUAKE III: ARENA



ZIFF-DAVIS WINBENCH 99 (2.0) BUSINESS GRAPHICS



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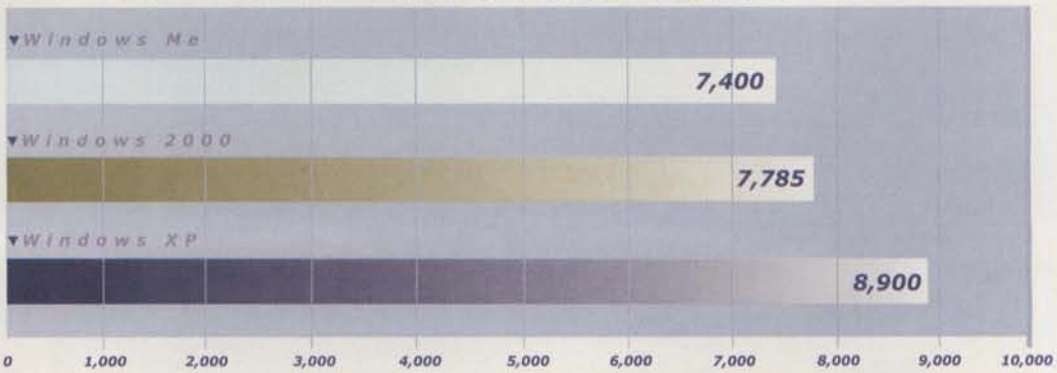
HARD DISK

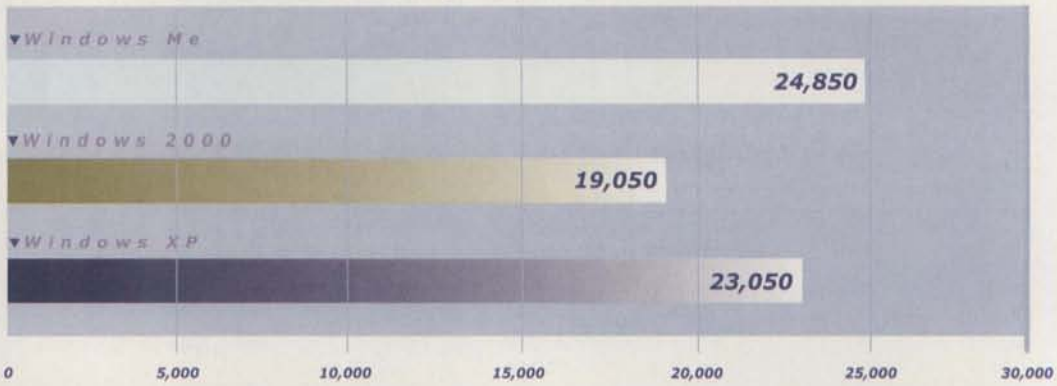
Continuing with the trend of focusing on everyday performance, general disk usage is a lot faster under Windows XP than either Me or 2000 (by 20% and 14% respectively). XP is better at shuffling little chunks of data, which makes performing small tasks such as attaching files, launching programs and opening documents quicker.

Windows 2000 has always suffered from weak driver support for faster ATA100 drives, and this has often resulted in slower disk access speeds. The irony is Windows Me can be a lot faster when it comes to high-end disk tasks such as rendering movies. While XP goes a long way to bridging the gap, it still falls a little behind Me in the Ziff-Davis High-End Disk test.

ZIFF-DAVIS WINBENCH 99 (2.0) BUSINESS DISK



ZIFF-DAVIS WINBENCH 99 (2.0) HIGH-END DISK



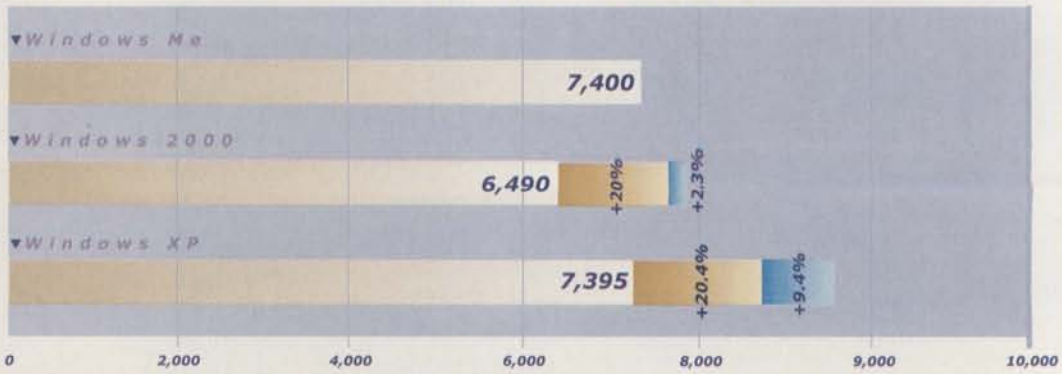
RAM SCALING

It's an old piece of computing advice — if you want better performance, add more RAM. This hasn't always been the case with previous iterations of Windows. Adding too much RAM in Me can actually have a detrimental effect on certain areas of system performance. The OS spends more resources trying to manage the excess RAM than using it.

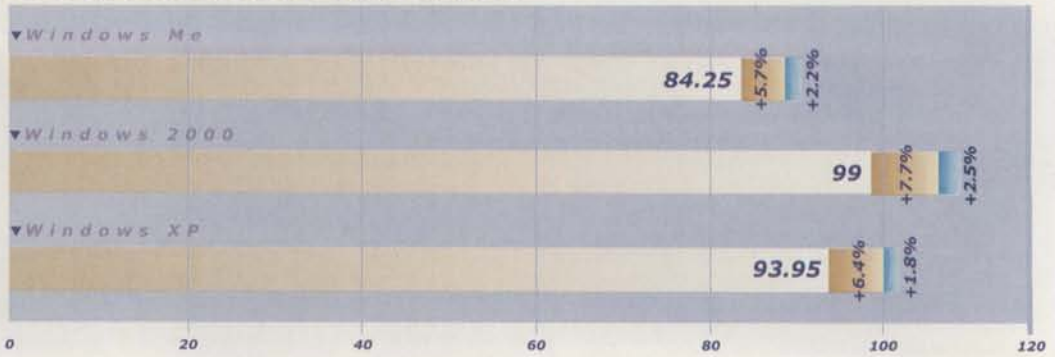
In applications, Windows 2000 handles RAM increments slightly better than either XP or Me, but there are areas where the new OS makes the best, broadest use of more RAM.

While drive performance tapers off at around 256Mb in Windows 2000, XP continues to scale up. This means that hard disk intensive activities, such as DV editing, will see a significant boost.

ZIFF-DAVIS WINBENCH 99 (2.0) BUSINESS DISK



APC APPLICATIONS BENCHMARK



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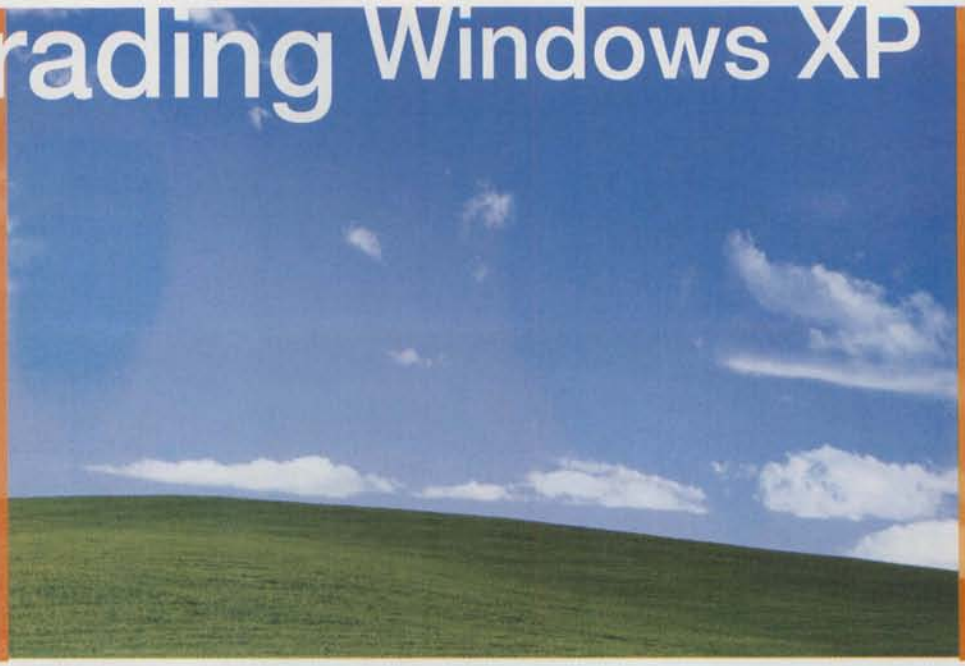
Upgrading Windows XP



UPGRADING TO WINDOWS XP FROM WINDOWS 9X OR WINDOWS 2000 IS DESIGNED TO BE A PAINLESS AFFAIR. MICROSOFT HAS INCLUDED A VARIETY OF NEW TOOLS WITH WINDOWS XP TO HELP STREAMLINE THE UPGRADING PROCESS.

UPGRADE ADVISOR

The Upgrade Advisor is a tool that has been made public by Microsoft to check your system hardware and verify that it is capable of running Windows XP. You can find the Upgrade Advisor on this month's CD set and run it on your own system to see if all your hardware is supported.

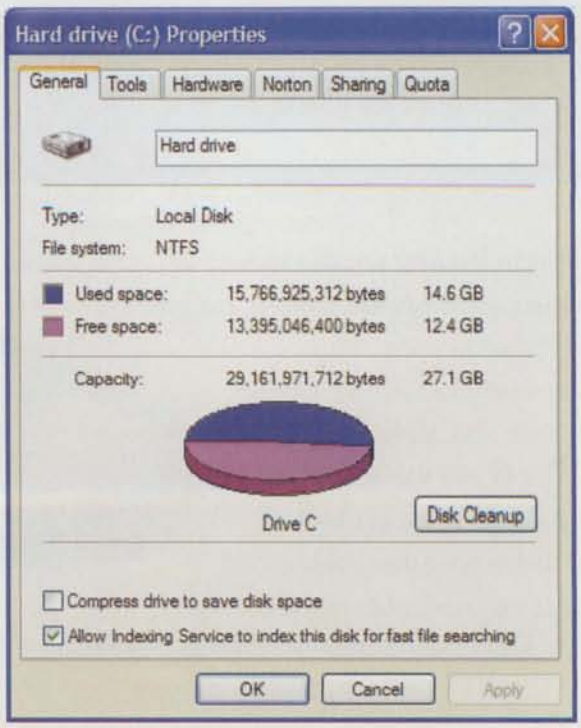
The Upgrade Advisor performs a check of system components and drivers before the installation has even commenced, and checks for any possible compatibility or driver issues. If any hardware components are found, the upgrade advisor will automatically connect to the Internet (or prompt you for a CD) for drivers for your unsupported hardware, and store them in preparation for the installation process.

After installing any extra device drivers that you might have downloaded, it's time to consider which file system you intend to use.

NTFS VERSUS FAT

Users coming to Windows XP from an NT/2000 background will already be familiar with the NT file system (NTFS), but it's a file storage method that is new to users of Windows 9x. One choice that you will have to make when moving to Windows XP is whether or not to stick with FAT, or to upgrade to NTFS. NTFS has many benefits over conventional FAT drives, including reliability, performance and speed, but any disks you format with NTFS will not be readable on a computer running Windows 9x.

When Windows NT was released, Microsoft technicians had to design a new system for storing and retrieving files based upon the demands of network use over the old FAT storage system, designed in the early 1980s. Extra security and reliability provisions had to be made in order to ensure that data was protected.



To check if your hard drives are using the FAT or NTFS file systems, right-click the drive in My Computer and choose Properties.

NTFS logs the file input and output events to a transaction log, so that if the system crashes, Windows XP is able to use this log to restore the volume to the exact state it was in before the crash. As no action is written to the log unless it's successfully executed, the log will always contain a list of the most recently edited files. Because of this level of protection, NTFS drives are very rarely corrupted, and work extremely well as file servers.

Another feature of NTFS that aids system security and stability is its ability to mark disk sectors as bad on the fly. If a bad sector develops on a drive while it is in use, Windows XP automatically marks sectors as bad as it encounters them, and moves the intact data to another sector. This is transparent to the user, but because the bad sector is never accessed again, the system doesn't experience any instability, and any applications that are resident in memory will maintain their integrity.

Files that are stored on a FAT drive are stored sequentially, while files on an NTFS drive use a binary tree. As a result, NTFS drives are faster at looking up files than FAT ones — while FAT drives use a table at the start of the drive to mark the locations of the data on the disk, NTFS drives use a binary tree to store the file information. This means that looking up a single file in NTFS out of 256 files will take a maximum of eight steps, as 2^8 is equal to 256; yet if the file is the last stored on the drive, it will take up to 256 steps to find it on a FAT drive. While this is a worst-case scenario, it highlights the possible gains in performance that can be garnered simply by swapping from FAT to NTFS.

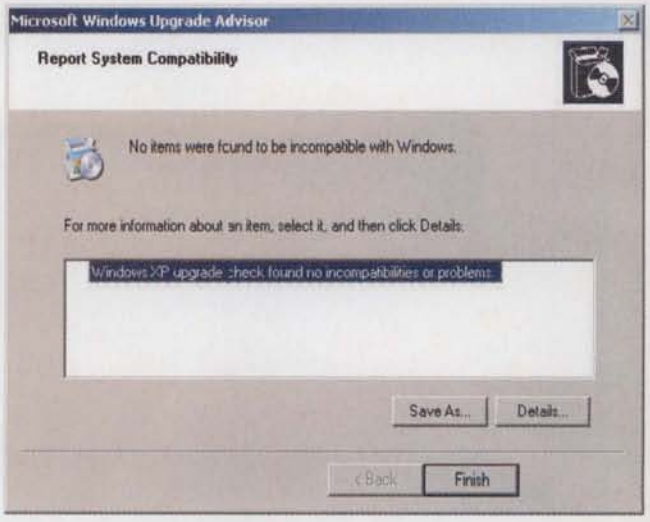
A final advantage to running NTFS over FAT is the way it uses clusters. Each hard disk is divided up into clusters, which is the basic unit of storage that is used to store files. FAT's drawback is that it can have large minimum cluster sizes (often as big as 32Kb), meaning that if you have a file that is smaller than the minimum cluster size, it still must occupy an entire cluster on the disk. On a FAT disk with a cluster size of 32Kb, a file that's 2Kb in size will take up exactly the same amount of room as a file that is 30Kb in size — 32Kb of disk space. A file that is 33Kb in size will have to occupy two clusters, and so on. By extending this, it is possible for a FAT drive to be unable to store any more data because all the clusters are occupied, where the total amount of data on the drive is nowhere near enough to completely fill it.

As NTFS volumes can use smaller cluster sizes, they can be set so that small files will occupy less storage space than they would on a FAT drive, thus you can actually recover disk space by swapping from a FAT partition to an NTFS one.

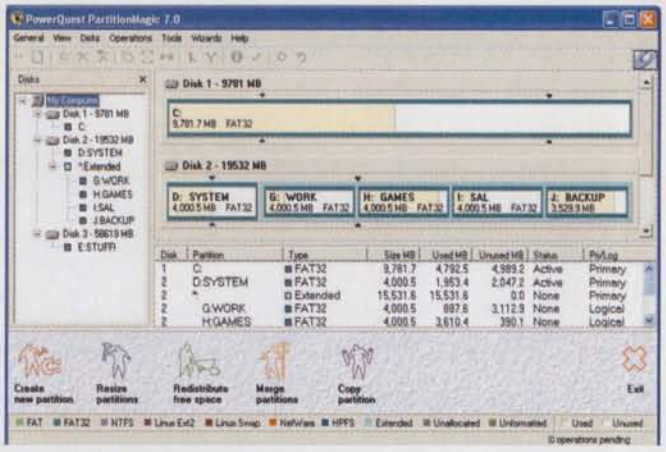
PARTITION MANAGERS

After you've chosen which file system you intend to use for your computer, there is a variety of options in terms of formatting your system. Windows XP has the ability to partition your system as you see fit — either by creating a new drive from blank space that it finds on your existing drive, or by repartitioning the existing partitions into another file system; for example, from FAT to NTFS.

You can use a partitioning program, such as Partition Magic, to rope off sections of your hard disk to use for the installation of Windows XP (and for the creation and management of partitions to use as data drives). These applications are more powerful than either Microsoft's fdisk application or the standard setup application provided with Windows XP, as they enable you to resize drives on the fly, convert from FAT to NTFS and to the Linux file system, and set up your individual drive partitions



The Upgrade Advisor checks your PC and verifies that it's capable of running Windows XP. This one looks ready . . .



Programs such as Partition Magic 7.0 make it easy to configure and manage your disk partitions.

BOOT MANAGERS

With the increasing popularity of alternative operating systems for the PC (namely Linux), Microsoft has acknowledged that people may want to run more than one OS at a time. Included in Windows XP is a functional, albeit simple, boot manager that enables you to select between Windows XP and the version of Windows that you upgraded from. Applications such as BootMagic also exist, and can enable you to run more that one operating system on a single computer.

Essentially, the way this works is by partitioning a single drive into several file systems, installing an operating system to each, and then displaying a menu system upon boot that enables you to choose which partition to boot from. The boot loader that is included with Windows XP is quite functional, however, and will suffice for the majority of users that are interested in running multiple operating systems.

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If the computing world was created anew with the release of Windows XP — if nothing but new hardware, software and peripherals existed from the Annointed Day, and all the old stuff vanished along with Windows 9x — compatibility wouldn't even warrant a footnote in XP.

But in reality, XP arrives into a world cluttered with PCs, programs and a million bits of add-on hardware. Most of them work under your current version of Windows. Microsoft's challenge is to make sure they work just as well, if not better, under XP.

This is especially important in a corporate environment, where purchasing upgrades to software applications can account for a substantial percentage of an IT department's budget.

For Windows XP, Microsoft has improved the code base of Windows 2000 and melded it with the compatibility of Windows 9x. Instead of introducing legacy code (some of Windows 9x's roots extend as far back as the late 1980s) to the updated Windows NT kernel, Microsoft employed new systems to ensure compatibility as well as stability.

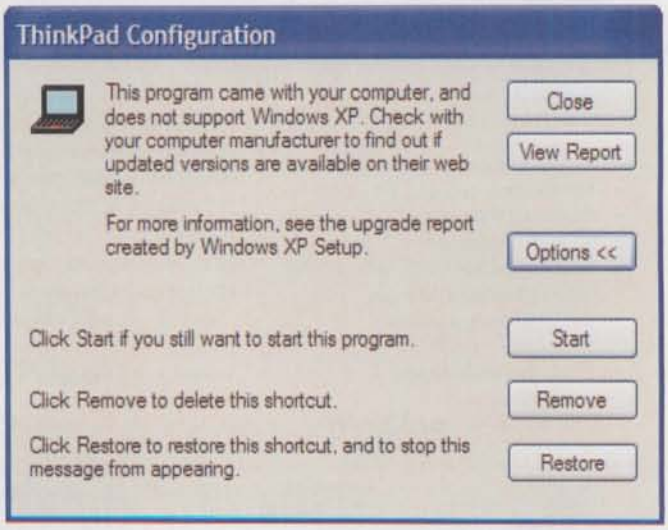
One of the largest improvements is Windows XP's DOS compatibility — it has even improved over Windows 9x, which was originally built using some MS-DOS code. It enables you to run old 16-bit DOS applications seamlessly in a window, even with full sound. This is an improvement over both Windows 9x and 2000, as many older applications (especially games) will run simultaneously with other 32-bit native applications.

A clever addition to the OS, entitled the Program Compatibility Wizard, enables you to specify which version of Windows you would like XP to emulate, so you can 'trick' an application into thinking that it is running under any previous flavour of Windows. This helps streamline the transition into Windows XP, as it means that many of your applications will be able to run without any modifications.

Another good tool is the AppsHelp dialog. If you attempt to run a program that for some reason has a compatibility issue with Windows XP, a window is spawned called AppsHelp. This will display a message saying why the application will not run, and attempt to download a patch if one is available. Application information is kept in Windows XP's AppCompat Database, which contains a list of details on compatible and incompatible software, and is updated automatically via the Windows Update site.

Oddly enough, programs already installed on your system prior to the XP upgrade are treated in a different manner. As part of its installation process, Windows XP creates a report on any of your current software and hardware that might not work with XP. This is filed away as C:\windows\upgrade.htm and can be launched by clicking a 'View Report' button in the dialog box that appears whenever you attempt to launch any of those programs.

As Windows XP functions slightly differently to Windows 2000 and Windows 9x, low-level operating system components (such as disk tools or virus scanners) for previous versions of Windows will not work with XP. Upgrade versions of applications like Partition Magic and Norton Utilities have already been released for Windows XP, and software support for the new OS is plentiful. Although Windows XP includes an application compatibility facility that enables users to run applications designed for previous versions of Windows, there are many instances of software that won't run under XP.



Windows XP intercepts preloaded software — in this case, a notebook utility — which may need an upgrade.

Windows XP uses a system of strongly enforced driver signing to ensure that hardware drivers are certified to work with the OS. Microsoft has worked hard with hardware vendors over the past few years to ensure that it has updated, verified drivers for most hardware components that are available.

Beginning with Windows 98, Microsoft started the Windows Hardware Quality Labs (WHQL), and gave certification to hardware that had drivers that passed certain criteria for stability and performance. The idea behind this is to minimise the support costs required through system failure due to the installation of drivers that are not certified.

XP's digital driver signing is a carryover from Windows 2000 and, like its predecessor, Windows XP does not block the installation of unsigned drivers. All the drivers that are available via a Windows update (either downloaded over the Internet or installed from a floppy or CD), are WHQL-compliant.

If you attempt to install an unsigned driver onto your computer, Windows XP will display a warning that the driver is unsigned, while

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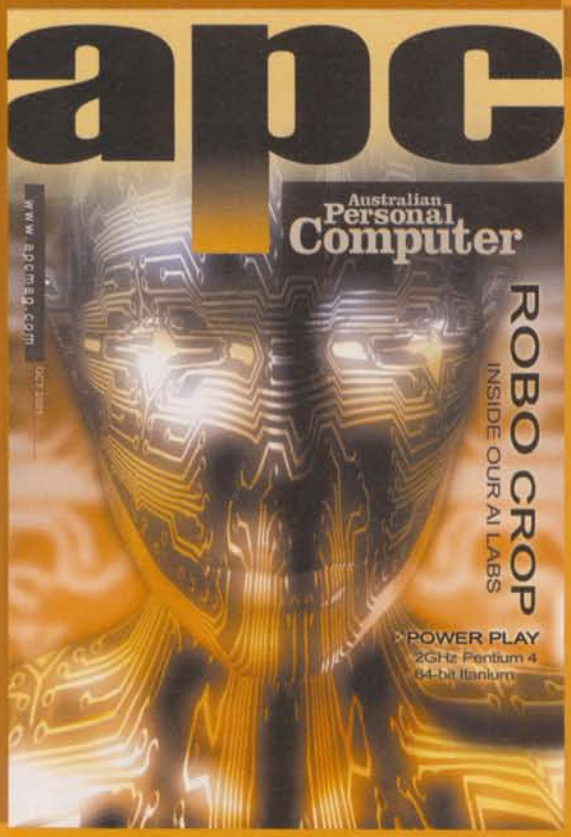

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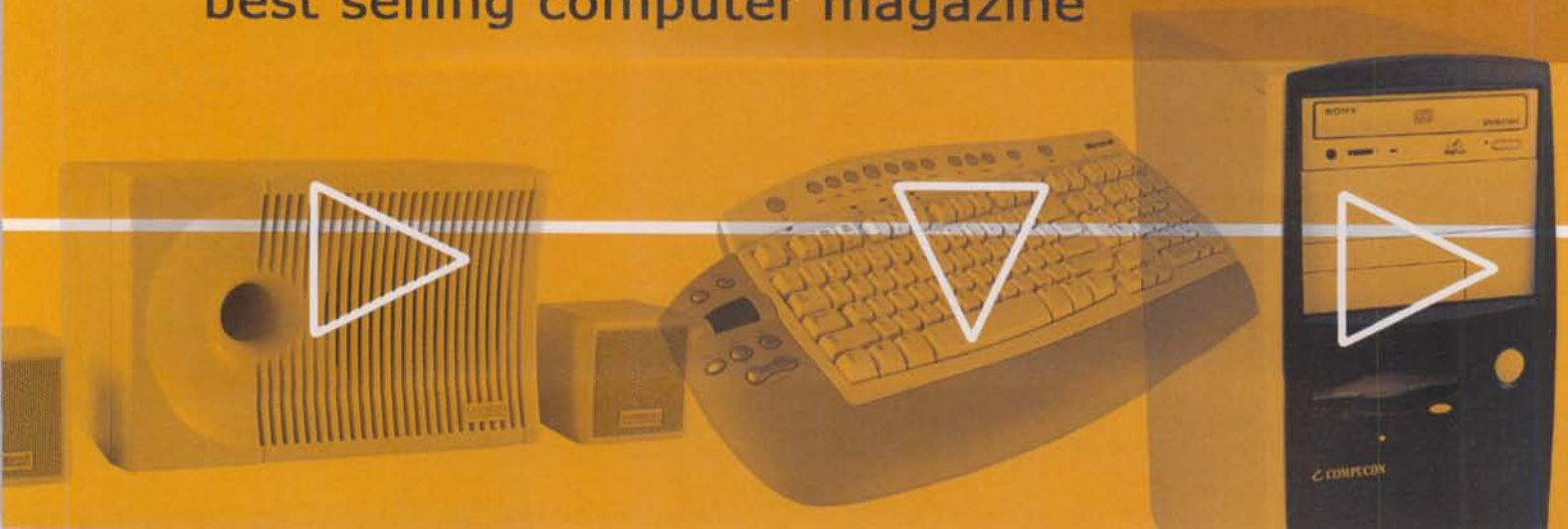

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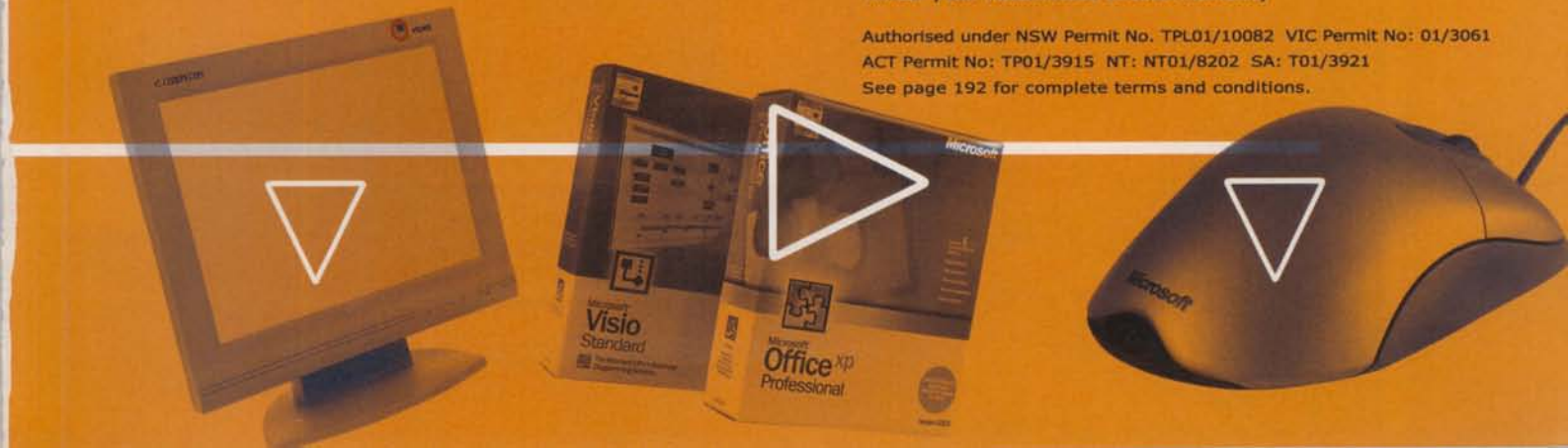
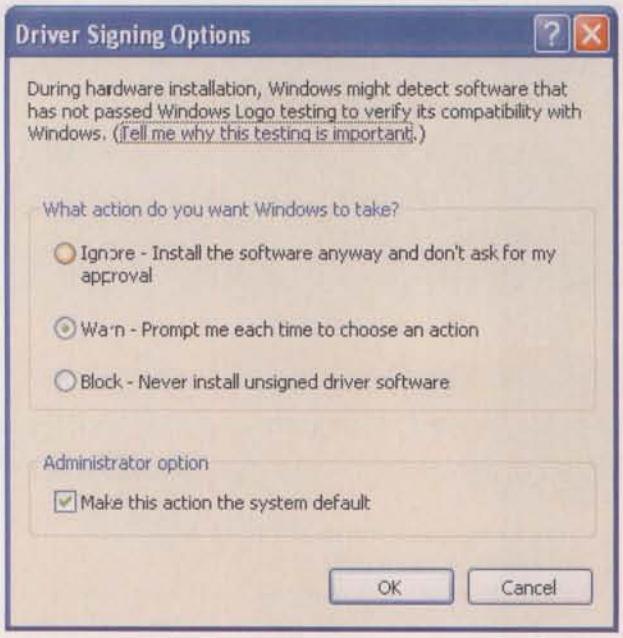
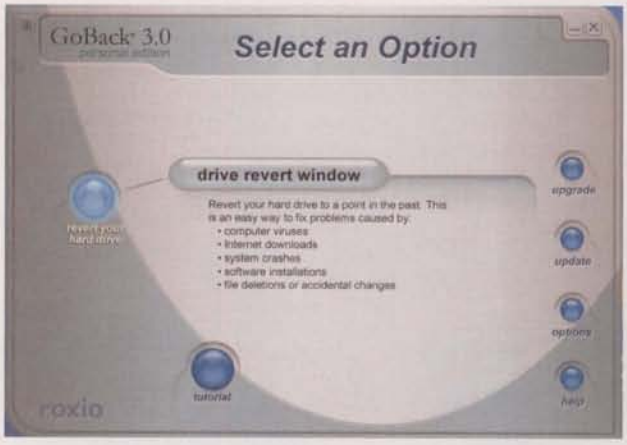


allowing you to ignore this and install it anyway. During testing, we had experiences when installing unsigned drivers for system devices ranging from the hardware installing without fault, to a flashcard reader crashing the machine.

While driver signing is far from the be all and end all of stability and security when installing new hardware, WHQL certification means that if you have a list of drivers to choose from, one of which is certified, you can be guaranteed that the driver will run. As it stands, the vast majority of drivers that are designed for Windows 2000 will work under Windows XP due to the common ancestry, however Microsoft is currently working on a unified device driver kit that will provide updated drivers for all Microsoft operating systems.



Windows XP utilises digital driver signing to ensure that drivers released for hardware meet Microsoft's standards.



Windows XP requires new versions of utilities that perform low-level disk operations, such as Roxio's GoBack 3.0.

UPGRADE CHECKLIST

Look, and look carefully, before you leap. Here are the essential steps for a successful XP upgrade.

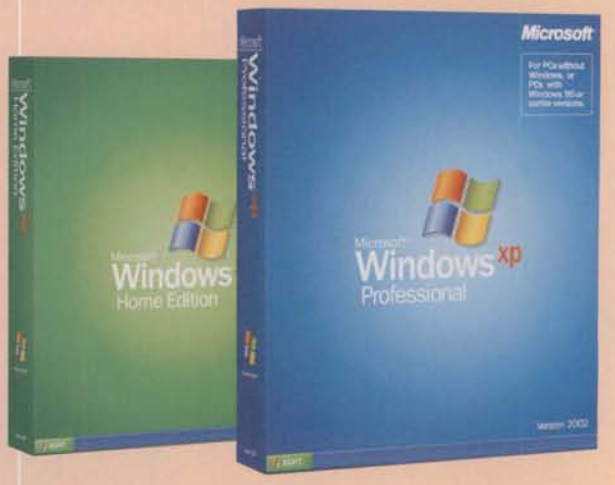
✓ It doesn't matter what Microsoft claims are the minimum specs for XP. We know you'd never believe them. Nor do we, which is why we have our set of real-world requirements for Windows XP. Don't even bother removing the shrinkwrap unless you have a 500MHz processor (even a Celeron will do nicely) with 128Mb of RAM and 2Gb of disk space. Any PC bought since January last year should be fine. If it falls short of the mark, consider some strategic upgrading. Drop in a faster chip, fit a second hard drive or add some more memory — it's down to $55 for 256Mb of brand-name RAM, so there's no excuse. Or just buy yourself that Pentium 4 you've been dreaming of.

✓ Make sure you buy the *right* version of Windows XP for your current system:
Windows 95 can't be upgraded, so you'll need a full version of Windows XP ($462 for Home and $675 for Professional)
Windows 98, 98SE and Me can be upgraded to either XP Home ($238) or Professional ($462).
Windows NT 4.0 and 2000 can *only* be upgraded to XP Professional.

✓ Run the Update Advisor (it's on this month's CD set, as well as on the Windows XP install CD).

✓ Update your BIOS and download the latest drivers (Windows 2000-compatible, if the XP ones aren't yet available) for any odd or uncommon bits of hardware which Windows XP may not recognise. If you're doing a clean install on a freshly formatted drive, save those downloads onto a CD or Zip disk.

✓ Some system-level tools, such as Roxio's GoBack, will need to be uninstalled before you can load XP. We suggest removing all non-XP utilities such as anti-virus programs. Or just back up your files, wipe the hard drive and give XP a fresh start.



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Product Activation

AND THE WINNER OF THE MOST CONTENTIOUS FEATURE IN XP AWARD GOES TO . . . WINDOWS PRODUCT ACTIVATION! BUT AFTER A ROCKY START, WINDOWS ACTIVATION LOOKS LIKE BEING A NON-INTRUSIVE NON-EVENT.

Windows Product Activation (WPA) is designed to ensure that every PC has its own copy of Windows XP, compared to the current situation where you can set up an unlimited number of computers with a single Windows 9x or 2000 CD.

The rules haven't changed: Microsoft's licence has always prohibited using one Windows CD to set up two or more PCs. But now that regulation is being stringently enforced with technology that locks your copy of Windows to your PC. It's intended mainly to prevent sharing programs with workmates, family and friends, which is estimated to account for 50% of piracy.

The howls of protest aimed at WPA are less about Microsoft's legitimate right to enforce its licence than the fear that users upgrading their PCs, or trying to load XP on a newly-bought system, would find themselves locked out.

We're pleased to report that it's nowhere near as bad as it seems. Microsoft has watered down WPA so that it's far more tolerant than at its beta-testing debut, and some welcome sticky-beaking by Fully Licensed (www.licenturion.com/xp) revealed the inner workings of Windows Product Activation, as well as allaying concerns regarding what data was sent to Microsoft during the activation process. Here's what you may have missed in all the noise.

Product activation must be carried out within 30 days of installing Windows XP, or the OS will disable itself. It's different to registration: activating XP is mandatory but anonymous; registering with Microsoft is optional, but it does require some personal data.

Activation starts with the 25-character Product Key of your Windows XP CD, which is entered during setup. XP also does a sweep of 10 pieces of hardware in your PC which bear unique serial numbers — such as the network card, video card, hard drive, CD or DVD drive, IDE and SCSI adaptors, and processor — as well as checking the amount of memory and whether the system is a dockable notebook. The resulting snapshot of your computer's current state is combined with the XP Product Key to produce a 50-digit Installation ID, which acts like a fingerprint of your XP system.

An activation wizard connects you over the Internet to a Microsoft server, which returns a Confirmation ID to match the Installation ID. This is automatically lobbed onto your system's hard drive (into a file named wpa.dbl) and Windows XP is officially activated.

You can also dial a toll-free number provided by the activation wizard, where a fellow human will ask for your Installation ID and provide a 42-digit Confirmation ID that you'll have to type into XP. Once again, the process is anonymous — while both wizard and human prompt you for your name, address and other details, you don't need to provide anything more than your country.

During our testing of XP, and the many times we've installed each new beta build, we've found the activation process to be painless, with Internet activations taking just seconds.

In fact, once the initial upgrade rush is past, the majority of people won't even encounter the activation process, because most PCs that come with Windows XP preloaded will also be preactivated — they'll be ready to go straight out of the box. But it's not activation which worries many users — it's 'reactivation'. If you upgrade your PC and install new components, will XP think you've got a new PC and demand reactivation — or worse, lock you out of your own system?

What happens when it's time to upgrade your hard drive or video card? What if you add more memory or fit a CD burner?

Not much, we're pleased to say. The 'fingerprint' code provides considerable room to move for the upgrade brigade. If your desktop PC has a network card, you can change five of the key hardware components without activation kicking back in, and you can get away with eight new bits of kit in a notebook (laptops get more leeway because their base hardware configuration can substantially change when they're plugged into a docking station). Desktop PCs sans network card are good for three component upgrades, notebooks for six.

Adding new components doesn't sound the alarm bell, only replacing existing items. Changing the same item several times — for example, going from 128Mb to 256Mb to 512Mb of memory — counts only as a single change, no matter how often you do it.

The final nicety is that WPA resets itself every 120 days. Your current system becomes the new base installation so you can begin the upgrade process again with a clean slate.

In effect, the only time anyone should see the Windows Product Activation wizard more than once is if their hard drive crashes or is reformatted — in which case the original activation code will work, because the hardware hasn't changed substantially.

If you step up to a new PC next year, it will come with XP preloaded and probably preactivated. In fact, most manufacturers are locking their OEM copies of XP to the PC's BIOS so users can swap everything bar the motherboard without hassle.

Businesses using five or more copies of XP can obtain a special licence key which negates the need for activation and permits 'ghosting' of a single hard drive image for any number of PCs.

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Upgrading to XP

INSTALLING XP MAY BE A BREEZE, BUT EVERYONE CAN DO WITH A COUPLE OF TIPS, ESPECIALLY IF YOU'RE UPGRADING.

Whether you're upgrading from Windows 9x, Me or 2000, the installation process for Windows XP is virtually the same. There are two methods of installing the operating system — either by booting the computer with the installation CD present, or by running it under an existing OS. If you opt to boot the computer directly from the CD-ROM, then you'll lose the ability to perform an upgrade installation over the top of your existing operating system, although you are still capable of installing the OS to a new partition and running a dual-boot system.

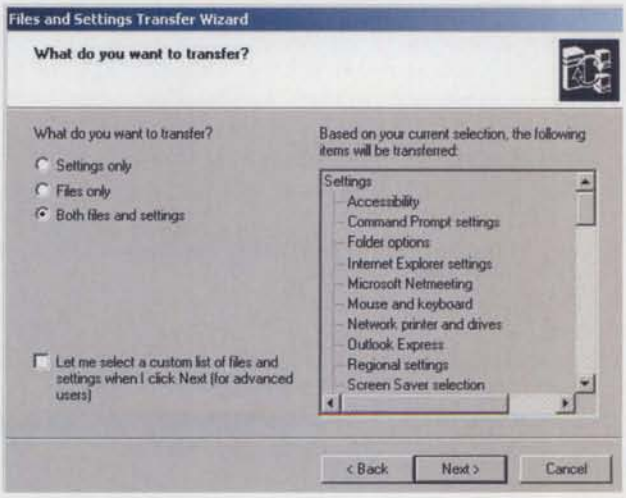
The most common method is to boot the computer using the existing operating system, and insert the Windows XP installation CD into the CD-ROM drive. If the Autorun option is enabled on your CD-ROM drive, an installation menu will appear. From here, you can perform a system check in order to download any extra device drivers that your system may need before launching into the installation of Windows XP. It's wise to do this before trying to install Windows XP, although you'll be alerted to any problems if you choose to go straight into the installation process. If you do choose system check, Windows 2000 prompts you to connect to the Internet if downloading extra device drivers is necessary.

After the drivers are in order, you are able to return to the main setup menu and begin to transfer the files to your computer. Before you commence installation, use the new Files and Settings Transfer Wizard to back up system settings and data files. Ideally, it's best to back this data up to a removable drive, or even a networked computer. You'll find the Files and Settings Transfer Wizard under the Additional Tasks menu on the CD-ROM, along with wizards to set up home networking and enable Remote Desktop. These applications can be run at any time, and are not necessarily used at the time of installation — even the Files and Settings Transfer Wizard can be used regularly to back up key system data to an external drive or computer.

From this point, you are prompted as to whether or not you would like to upgrade your existing version of Windows, or install Windows XP afresh. If you opt for the latter, you'll be presented with options for partitioning your drive, and installing XP to an alternative disk from the one containing your primary OS. It's highly recommended that if you are going to run two versions of Windows, you do it on different drives (or different partitions). If you opt to upgrade, you are not prompted with the dialogue to set up a new partition — Windows XP will be installed over the top of your existing OS, maintaining any system settings. When you boot Windows XP for the first time, any application data, Internet and network settings will be carried over from the previous version of Windows.

After you have agreed to the software licence and entered your product code, you are presented with an option to download any missing device drivers that you may have neglected to download previously. After the completion of the Dynamic Update wizard, the transfer of Windows XP's data files commences. The total installation time is around an hour and a quarter.

Using the Files and Settings Transfer Wizard, you can back up vital system settings and data effectively.



The list of personal information stored using the Files and Settings Transfer Wizard is extensive.

Installing to a partition

FOR THOSE WHO AREN'T SURE ABOUT UPGRADING TO XP, THERE IS THE OPTION OF INSTALLING IT AS A SECONDARY OS, AND KEEPING THE ONE YOU ARE COMFORTABLE WITH.

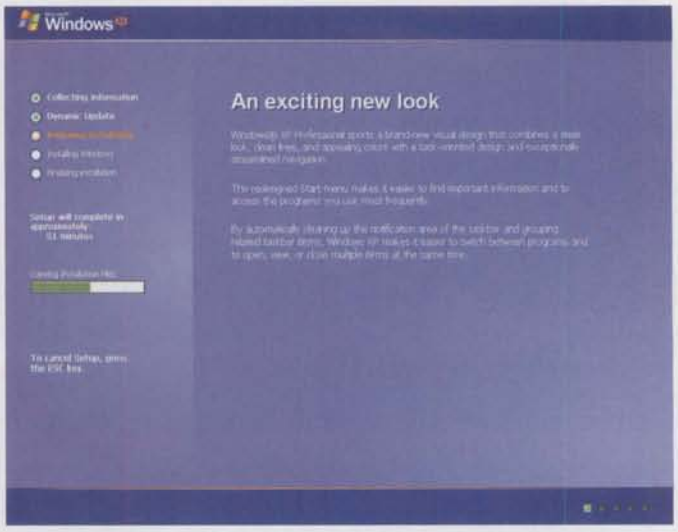
An alternative method of installing Windows XP as a secondary operating system on your PC is by booting the computer using the installation CD-ROM without first loading another operating system. Using this method enables you to set the partitions for your computer, as well as install Windows XP as an alternative OS instead of upgrading your original. It's not possible to perform a transparent upgrade over the top of an existing Microsoft OS using this method — you can only install XP as an alternative operating system. If you are intending to install Windows XP transparently over the top of your existing OS, then you'll have to do it from within the OS you wish to replace.

If you boot your computer with the Installation CD in the drive, you are automatically taken to the text-based setup menu. After agreeing to the Windows licence, you are presented with a partition setup screen. From here you can choose where to install your copy of Windows XP. Assuming that you have your primary OS already installed on drive C (the primary OS being the one that you are upgrading from), you'll probably want to use drive D for the installation of Windows XP. From the partition screen you can create new partitions in any empty (unpartitioned) space, delete existing partitions, and select a partition to install XP into. You can't resize and merge partitions via the Windows XP setup program, so if you would like more advanced control over partitioning, we recommend using specifically designed partitioning software such as Partition Magic.

After you have selected which drive to use, you are presented with another list of options, enabling you to format the drive in either NTFS or FAT formats, convert the drive partition to NTFS, or leave the drive intact. The reasons to change to NTFS are compelling, and unless you are going to be removing hard disks and using them in computers that are running Windows 9x, there is no real reason not to use it.

After finalising the partition settings that you intend to use, Windows XP is copied over onto the designated drive, and after running through some system settings, the computer will reboot.

If you opted to install to a new partition, you'll be presented with a boot menu the next time the computer is restarted. The menu options will include both the operating system that you had installed before Windows XP and XP itself. After XP is chosen and loaded for the first time, a wizard appears asking you if you want to update your drivers, and a facility is provided to connect to the Internet to do so.



Reminiscent of previous Microsoft operating system installers, the Windows XP version is straightforward and clean in appearance.

Bear in mind that unless you have transferred the settings from your previous operating system using the Files and Settings Transfer Wizard, you'll have to go through and manually install and configure all your software and personal settings, so make sure that you have them close to hand. After you have installed Windows XP to a new partition, you can still use the Files and Settings Transfer Wizard to copy all the data from one operating system to another. This can save you a lot of time, although you're best off just copying system settings and not data, to avoid duplication.

Although this method of installing Windows XP utilises a text-based installer as opposed to the graphical interface under Windows 9x or NT/2000, it's beneficial to be able to have some control over the partitions of your drive, even though the control is somewhat limited. If you are interested in configuring your drives for optimum performance, it would be preferable to use a dedicated partitioning program. All told, every care has been taken on behalf of Microsoft to ensure that the upgrading process is seamless and painless and, in our experience, the diligence has paid off.

Choose the 'New Installation' option to load Windows XP onto a separate partition from your current OS.

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COPYCAT CRIME

BY WILLIAM MAHER

DESPITE REGULAR BUSTS, THE DIGITAL PIRACY COMMUNITY IN AUSTRALIA AND ABROAD IS GROWING. COPYRIGHT INVESTIGATIONS ARE CONTINUING, BUT THE INDUSTRY ENFORCERS ARE LOSING GROUND. WHERE TO NEXT IN THE WAR BETWEEN BIG BUSINESS AND THE COPYCATS?

The war on digital piracy — where to now?

WHEN POLICE ARRIVED, THEY FOUND A HOUSE FULL OF CHEAP plastic jewel cases. The lounge room, the kitchen, the bedrooms and even the carport were being used to store illegally copied CDs. There was little furniture, just hordes of boxes.

Whoever lived there — in a quiet suburban street in Sydney's south-west — had turned it into an Aladdin's cave of illegal video tapes and CDs.

The lounge room was bare apart from a widescreen TV, a coffee table stacked with VCRs and DVD players, and boxes of blank VHS tapes. The kitchen housed a shrink-wrapping machine, and, but for one shelf of food, the pantry was stocked with more CD cases.

But this was only for starters. Both bedrooms contained stacks of up to 10,000 CD cases, along with 15 CD burners; the carport was stuffed with enough boxes to hold 250,000 jewel cases; and the garden shed was overflowing with 145,000 counterfeit CDs — movies, software, pornography, video games. The cache was enormous.

The raid, conducted late last year near the Sydney suburb of Liverpool, is a typical story from the frontline battle against piracy. At times it reads like a crime thriller — detectives, undercover operatives, telephone intercepts and even boats with secret underwater holds, used for smuggling CDs. In some cases the culprits are hardcore criminals, with weapons and links to the world of organised crime.

Faced with huge losses, record companies and movie studios are turning to a new weapon in the fight against piracy: technology. There is a frantic rush to create a music CD or DVD you can't copy. With Napster all but gone, the pressure is also increasing to somehow control the piracy free-for-all on the Internet. It's not just hardcore criminals who are being targeted: the battlefield will include schools, offices, home offices and teenage bedrooms.

ONE OF THE KEY BEHIND-THE-SCENES OPERATORS IN THE battle against piracy is Michael Speck. Speck is an ex-police officer now working as a private investigator for Australia's music industry body, ARIA. The first time I saw him was in a newspaper photo — he's standing in a warehouse, brown boxes full of illegal CDs stacked up and teetering precariously around him. He's not smiling.

Speck's job is to hunt down and help prosecute pirates, both in Australia and overseas. There are raids every two to three weeks and at any one time he has 40 to 50 cases ready to prosecute.

FACED WITH HUGE LOSSES, RECORD LABELS AND MOVIE STUDIOS ARE TURNING TO A NEW WEAPON IN THE FIGHT AGAINST PIRACY: TECHNOLOGY.

When I visit his Sydney offices, they are still overflowing with boxes of police evidence from a recent raid, this time near Penrith in Sydney's west. Speck helps to store evidence when the police run out of space. The room is now piled high with monitors, computer boxes, printers and hundreds and hundreds of CDs. This must have been a *big* haul.

I step over the blue and white chequered police tape and grab a handful of discs: *Cruel Intentions*, *Pleasantville*, *Liar Liar*. Another drawer is filled with software: *Microsoft Publisher*, *Encarta*. Instead of printed covers, the names have been scrawled with a fat black texta. "Anything you want, you'll find it in here," Speck says.

Speck is frank about the extent of the problem. "Australia is an incredibly attractive target for countries nearby. The profits are high and the margins are low." He says a counterfeit CD that sells for $2 or $3 overseas can be sold for $10 to $15 in Australia. Most of Australia's counterfeit CDs are from piracy hotspots like South East Asia.

In many ways, the pirate groups act just like legitimate businesses. They have offshore warehouses and compete for territories and markets. In one Sydney raid in 1998, police seized 20,000 counterfeit CDs and $250,000 worth of equipment.

Pirates have a smorgasbord to choose from — not just music CDs, but business software, video games and, increasingly, films. Ten years ago, pirates specialised in software or VHS videos. Now everything is ripe for copying. The fakes are also getting harder to detect. "We've got examples here that are so good they could pass for the real thing," explains Speck.

It seems to be a losing battle. Despite attempts to get tough on piracy — in August a Melbourne shopkeeper became the first Australian to be jailed for selling pirated CDs and vinyl records — the problem seems to be getting out of control. Want the latest computer game? Look hard enough and you'll find a shop selling illegal copies for a fraction of the official price.

What about the raids, the detectives, the truckloads of boxes? Didn't this latest haul have any effect? Speck is blunt: "This has not had any impact on the marketplace. These people have simply been replaced."

FINDING AN ANTI-PIRACY TECHNOLOGY THAT WORKS hasn't been easy for record companies and movie studios. The latest round of efforts was sparked by the emergence of MP3 music files and Napster in the 1990s. People began asking: "Hey, why bother with CDs when I can grab music for free off the Net?".

Record companies are still experimenting with anti-piracy technology. Their latest trick is to add deliberate errors to the music tracks when manufacturing CDs. Hi-fi systems and standalone CD players have circuits to hide these noises, as they do with a smudge or scratch. But try copying the disc in a computer, and your PC will think it's a dud and give up. Most major record labels, including Sony, BMG, EMI, Universal and Warner, are experimenting with the technology.

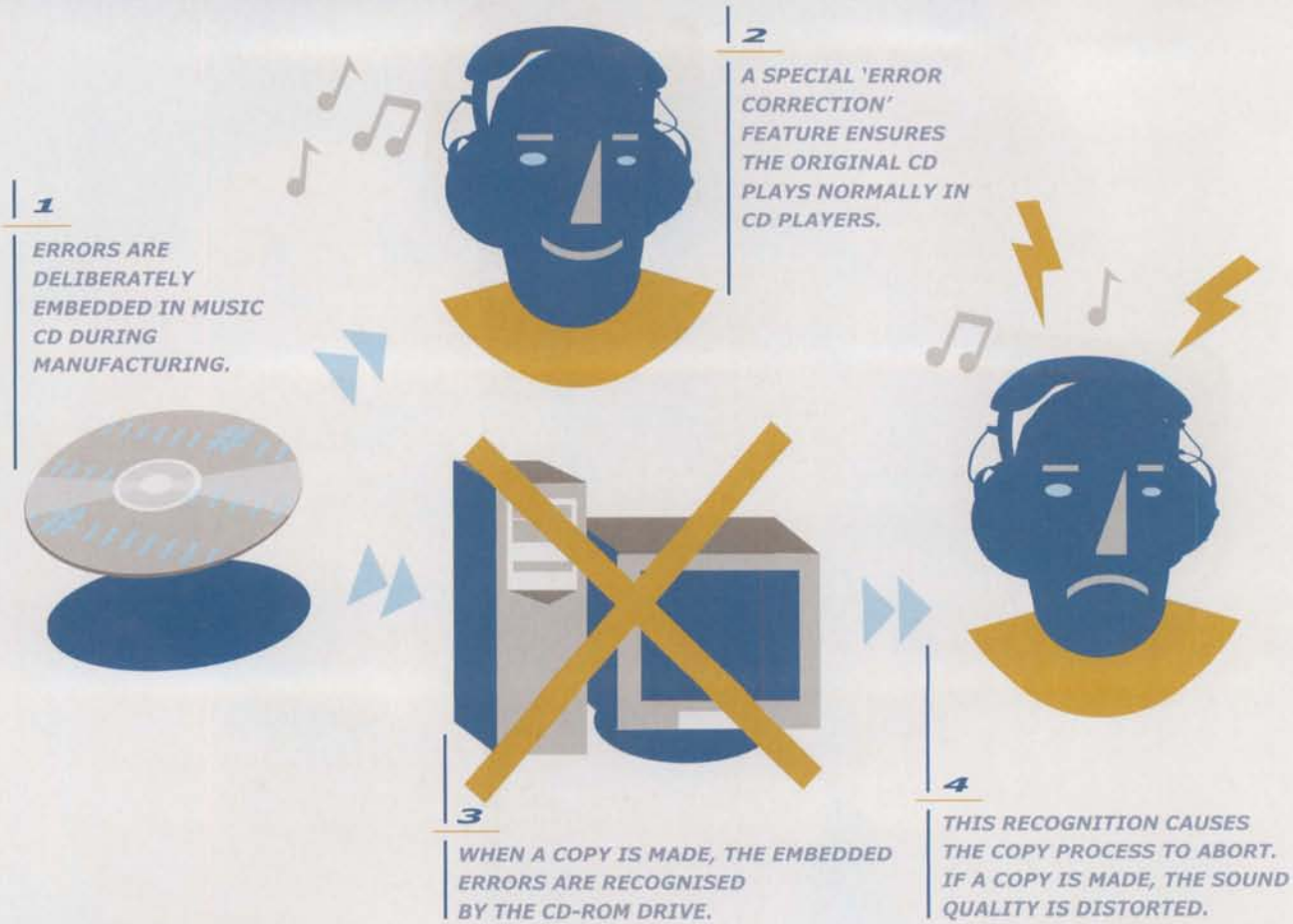
Trouble is, someone found a way around it. Copying the discs is as easy as replacing a Windows driver file, then using some custom software (a free download) to rip the songs to your hard drive. Strike one against the copyright owners.

It's a similar story with DVDs. Most discs are encrypted using the Content Scrambling System (CSS), meaning the video has been jumbled using a special code. To 'unlock' the video, your DVD player needs a special 'key' which is on the disc. You can copy the disc, but not the key, which means your newly burnt DVD will be useless.

But cracking CSS has also proved embarrassingly easy. Programmers created a tool that could unscramble the video from a DVD and save the stream to a hard drive. Initially it was possible to squeeze the video onto a CD; now you can use Pioneer's new DVD writer. Strike two.

"AUSTRALIA IS AN INCREDIBLY ATTRACTIVE TARGET FOR COUNTRIES NEARBY. THE PROFITS ARE HIGH AND THE MARGINS ARE LOW . . . WE'VE GOT EXAMPLES HERE THAT ARE SO GOOD, THEY COULD PASS FOR THE REAL THING."

MICHAEL SPECK



NAPSTER-PROOF CDs

The latest hope is that digital watermarks could be used to stop copying, and to trace copies across the Internet. Just like the microscopic marks hidden in banknotes, 'invisible' pieces of information can be embedded in footage on a video cassette, a cable or satellite television program, or a digital television feed. The information could be a copyright notice, a serial number, or details of where the footage was purchased or downloaded. In theory, the watermark should be permanent, no matter how many times you copy or compress the video. Watermarks have also been devised for audio CDs, but they aren't being used yet.

Based on past experience, it won't be long before the Internet community finds a way to thwart watermarks too. It's a tit-for-tat battle. As soon as anti-piracy technology appears, the race is on to find a loophole. By some estimates, there are a whopping 46,000 pages on the Internet containing 'Crakz' — the hacker's term for serial numbers, codes and patches for disabling copy protection. It's a virtual hacker's toolkit, just waiting to be downloaded.

The people doing the downloading aren't just hardcore geeks. They include teenagers, university students, movie buffs and video gamers. Many PC owners prefer to put a big list of MP3s on their hard drives rather than listen to CDs. If a CD comes along that they can't copy, their first reaction is to look for a loophole.

Until now, no major copyright technology has been successful. SDMI (used to control the sharing of audio files), 'Napster-proof' CDs and DVD scrambling systems: in each case there's an Internet site that shows, step by step, how to bypass the protection. The problem is that it is very hard to keep data under lock and key. Copyright owners can scramble the film on a DVD or the music on a CD, but eventually the material must be decoded so it can be viewed or listened to. It's at this point that it becomes vulnerable to copying.

The number of people in the know about these loopholes is growing. A good example is 2600 Australia, a loose-knit group of computer enthusiasts interested in computer security, electronic gadgets and communications. They meet online and at regular get-togethers in cities around Australia. Many are computer professionals, but mostly they're young: less than 23 years old. They're not all hackers, but most have an interest in exploring technology.

Grant Bayley, unofficial spokesperson for 2600 Australia, sums up the attitude of many in the group when he says that "copyright protection has more money behind it than sense".

"Even if it's a brand-new, unique type of protection, someone will eventually figure it out. All they've got to do is open up the thing, debug it and watch the flow of information . . . I've seen a few guys working on it. It's pretty scary."

EVEN WITH NAPSTER GONE, THE NET IS STILL A HAVEN for pirates. In Napster's place, a bunch of other all-you-can-eat download communities have sprung up, and they're even harder to shut down. Market research company Webnoize claims there were 3.05 billion files shared between Net users in August alone. You can bet a big chunk of those were illegal copies.

Policing the Net seems an ad hoc affair. Groups like the Motion Picture Association of America (MPAA) use special search tools to scour download services, FTP sites, chat channels (IRC), newsgroups

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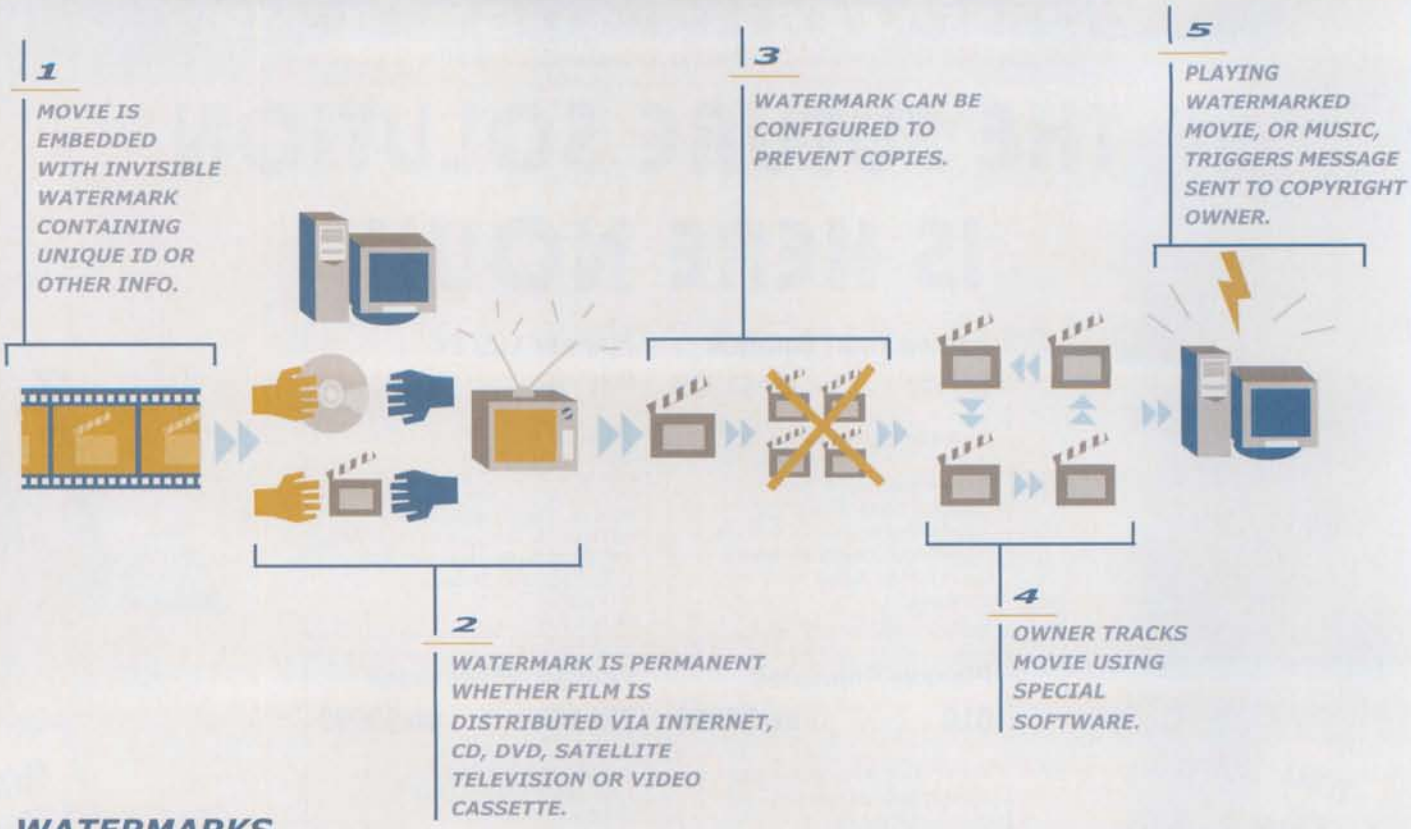

WATERMARKS

and even auction sites. The idea is to locate an illegal download, find the downloader's IP address, contact the ISP and ask for that person's mailing address. Usually the offender receives a letter, or the ISP might suspend their Internet account. In the case of one Oklahoma State University student, police actually confiscated the computer.

Cases like this are rare, but pressure is increasing for ISPs to crack down on file sharing. Cable network Optus@Home is just one of many ISPs that warns it may immediately terminate customer accounts if alerted to a breach of copyright. There are also 'pirate-hunters' in the US — companies which troll the Net looking for pirates on behalf of copyright owners.

The aim of record companies is that one day, we'll all pay to download music online. Trials are already in progress, using sites such as Pressplay set up by Vivendi Universal and Sony, and the MusicNet venture involving EMI, AOL Time Warner and Bertelsmann AG. Even the technology behind MP3.com is now part of the pay-to-listen pop phenomenon.

Unsurprisingly, these songs don't like being shared. You can copy the files, but you need to pay for and download a special permit before you can listen. The system is called Digital Rights Management (DRM). Eventually DRM could be used to keep a tight leash on all music and movies, whether they are on CD, DVD, MP3, DivX or any other format.

In the meantime, there's no sign of this protection technology having any effect on the piracy problem. Australia is awash with pirated discs. It's hugely popular: home-made music compilations on CD, gigantic MP3 collections; everyone's doing the burning thing. In the corporate world, the Business Software Association of Australia makes headlines by embarrassing companies who are caught red-handed with counterfeit software. At the airport, customs officers confiscate crateloads of illegal CDs. Down at the flea markets, Sony has its hands full trying to stop the sale of dodgy PlayStation discs.

Some argue that the problem will never be solved until there is a national framework set up to deal with piracy. The government collects no statistics about the extent of the problem; it relies on evidence from outside sources. Speck complains that fewer than 1% of his cases are dealt with by police. A parliamentary committee last year recommended that the Australian Federal Police set up a task force to combat the problem. This has not happened yet.

Meanwhile, guerilla warfare with the pirates continues. Police arrested two men selling dodgy PlayStation discs at Paddy's Markets in the heart of Sydney. It seems the weekend stalls were popular for offloading carloads of copied video games. Sony has seized more than 70,000 PlayStation discs from various raids around Australia in the past two years, though local managing director Michael Ephraim knows he's only made a dent in the problem.

"These people are very smart; they move their operations around. We know that even though we get wins in court, and we get a few fines and prosecutions, we can't assume that piracy isn't going to happen any more," he said. "We know that once we back off, they'll be back at it again."

Michael Speck agrees. He reckons he has a long career ahead of him battling backyard dens and counterfeit syndicates, despite the current claims being made about anti-piracy technology. He explains: "We are still seeing substantial leapfrogging between pirates and copyright owners. Anti-piracy technology is a sitting target. Record labels have to completely expose their protection and then sit back and wait for an attack."

When I last spoke to Speck, business was busier than ever. At last count his team had eight full-blown operations underway, surveilling commercial CD-R counterfeiters. The chase also led him online, to data merchant sites where movies and music can be downloaded on the cheap. Looked like another one of those weeks. ■

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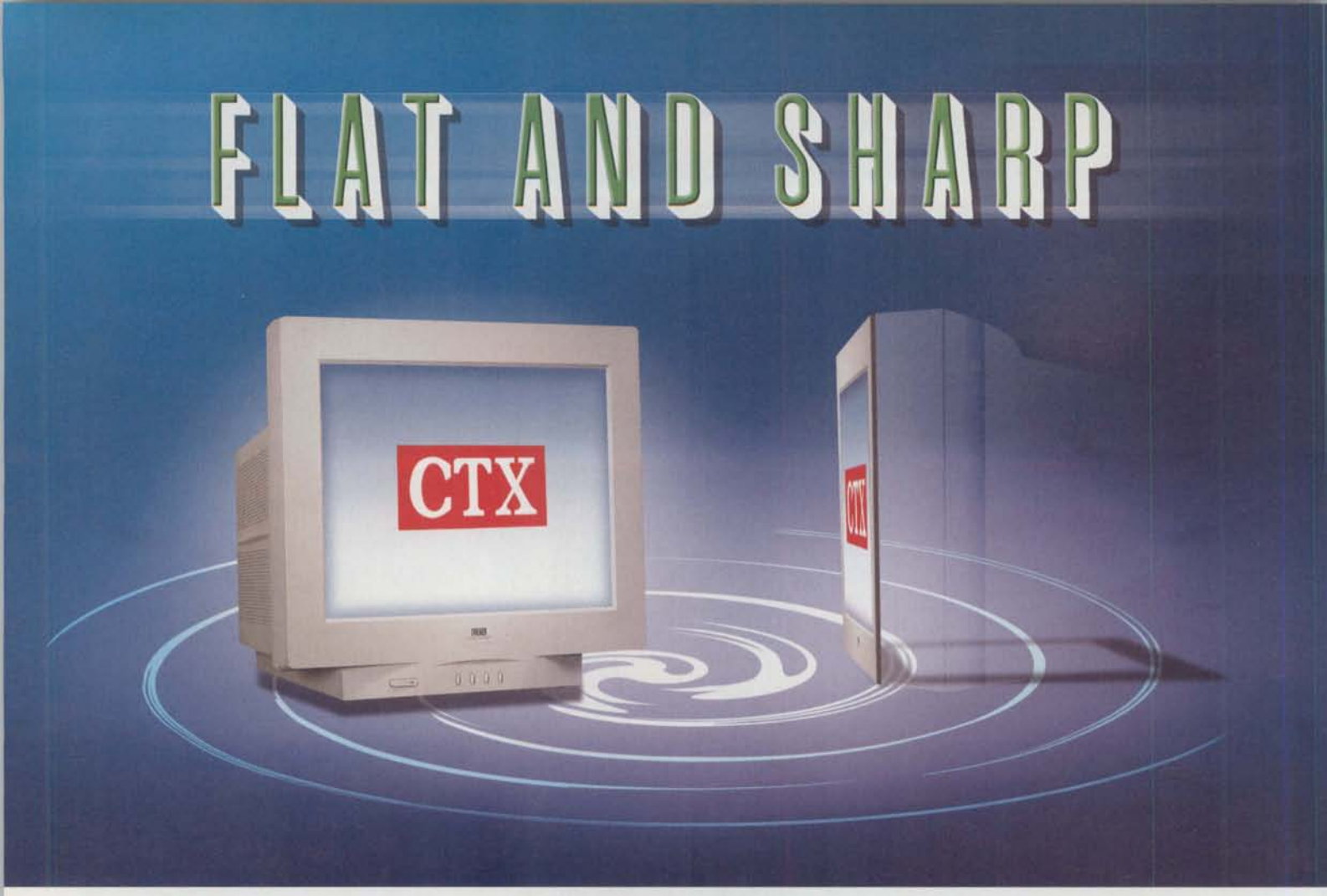

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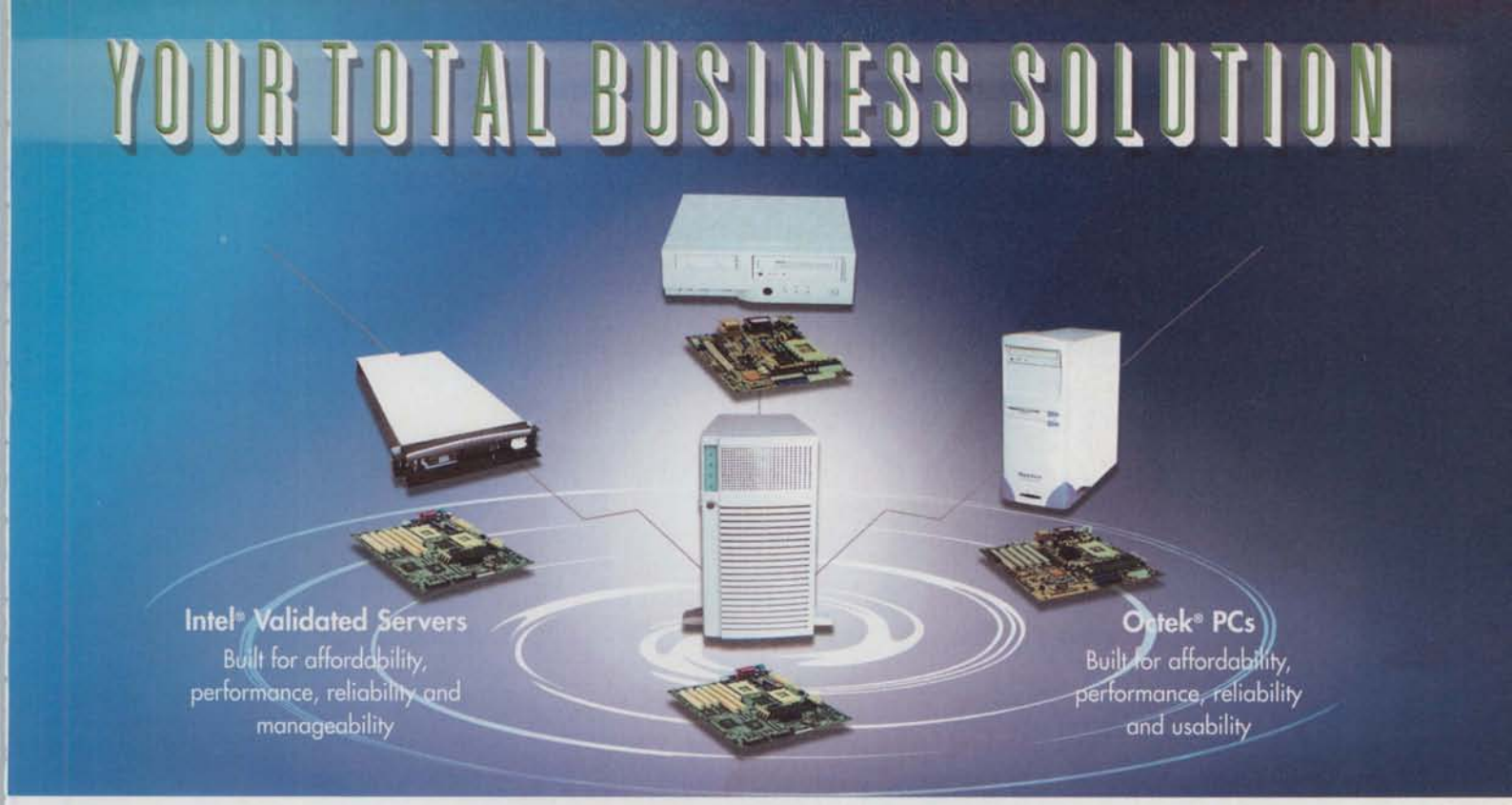

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FORGET EMAIL AND CORPORATE HOME PAGES. CLEVER COMPANIES ARE FINDING NEW WAYS TO USE THEIR INTRANET.

MAX POWER

BY DAVID BRAUE

RELEASE YOUR INTRANET'S POTENTIAL

Are you getting the most out of your intranet? Probably not, if the results of one recent survey are anything to go by.

Melbourne-based software developer Internet Business Systems (IBS) recently found that over 80% of the companies it surveyed have invested in intranet technologies but aren't using those technologies to their full potential. The main reasons for this figure, according to IBS, were a lack of staff training, old technology, difficulty keeping intranet content current, and a reluctance to share the sensitive information that would turn the intranet into a meaningful educational resource for employees.

However, there really is no reason your intranet can't be the informational centre of your business. At the very least, it should offer services such as an employee directory; standard leave and other forms for printing, if not actual online lodgement; and a reservation system for meeting rooms and other shared resources. It should also provide up-to-the-minute information about the company's activities. To avoid being stranded with out-of-date information, you need to make sure that employees share responsibility for posting information that they produce, instead of depending on just one person to do all the work.

"Most organisations have put in an intranet or played around with the concept, but most of them aren't satisfied with it," said David Brykman (pictured next page), CEO of Internet Business Systems. "It's exceptionally difficult to get people to use intranets in the first place, and that's basically because people don't see the value in them. Whenever you're introducing a new tool into the organisation, the challenge is for people to realise the benefits it can give their working environment. Rather than looking at the intranet as a

VOICE OVER IP SPEAKS VOLUMES FOR VICTORIAN LIBRARY

As the State Library of Victoria's PABX maintenance contract was coming up for renewal at the end of June, the organisation began reassessing its voice communications to see how it could best replace its 14-year-old NEC PABX, which didn't even support voicemail.

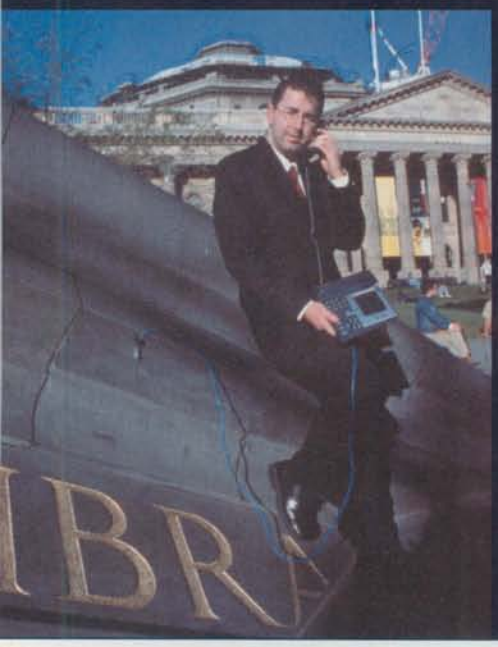
The library decided that the best choice was to exchange its 330 phone handsets with Voice over IP (VoIP) models that would run over its existing intranet. It then replaced the PABX with Cisco Systems' VoIP-capable network switches, which move the voice data around the intranet.

Instead of relying on separate phone and intranet data ports at each desk, phones in the new system are plugged right into the intranet and managed just like PCs. Handsets can be moved between desks as necessary without having to reconfigure the PABX, and administering the system is as easy as pointing a Web browser at the Windows NT server on which it runs.

State Library employees all have access to voicemail, and can handle phone calls at the same time as pulling up customer details over the intranet. Call forwarding, hunt groups and multiple reception areas have all been programmed to emulate standard PABX services.

The benefits of the move have been considerable. For example, the library is saving about $100,000 a year in PABX rental. After two years the library will own the VoIP equipment, so it's ongoing capital costs will be virtually nil.

"The functionality we were getting out of our PABX was pretty limited," said Ian Patterson (left), manager of the State Library's technology services division. "The functionality that IP telephony provided surpassed the other options, and it integrated with our existing intranet quite effectively. It has very good reporting capabilities, is easy to maintain, and it no longer takes days of waiting for the service provider for anything to get done. It's opened up many new possibilities."



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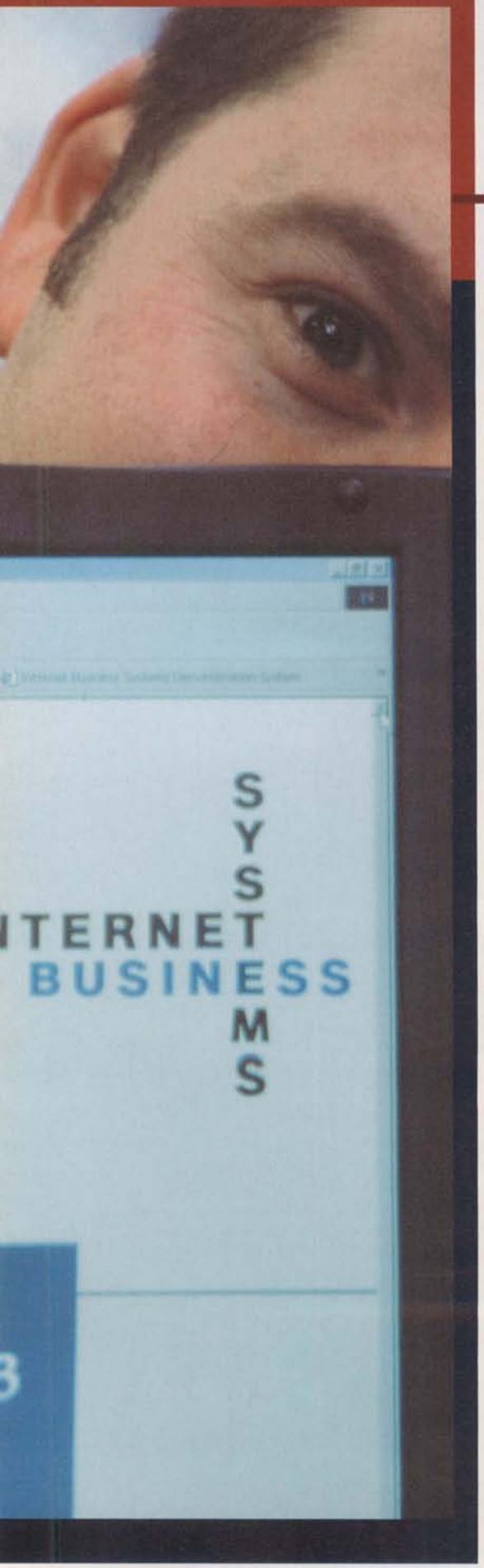

VIDEOCONFERENCING CAN BE EXTREMELY EFFECTIVE IN IMPROVING COMMUNICATIONS BETWEEN MEMBERS OF A PROJECT TEAM.

nice way of publishing pretty pictures and articles, you should look at the intranet as a way of publishing pretty important business processes."

When companies take this approach to intranets, the benefits speak for themselves. In the early days of the intranet, research firm META Group found that 80% of companies deploying an effective intranet showed a positive return on investment — on average, a 38% return.

The key word here is 'effective', and that's where you're going to have to do some soul searching. Have you established an accurate way of measuring the benefits of your intranet? Are employees using it, and are there other things they'd like to see it provide? It probably needs regular makeovers to keep it fresh and useful.

Whatever it takes, make sure you stay on top of your intranet's progress. By continually refining the mix of services and information you provide over your intranet, you can ensure it works to maximum benefit for you and your employees, and becomes an intrinsic part of everybody's working day. Over the next few pages, we've provided some options to jog your creativity.

VIDEOCONFERENCING

It was once a dream of science fiction magazines and the inspiration for some highly unsuccessful video phone prototypes, but the rapid setting of standards in the past five years has made desktop videoconferencing quite useful.

Small video cameras that sit on top of a desktop computer's monitor are now relatively inexpensive: entry-level devices from Intel and Logitech retail for around $85 each. If your employees' jobs warrant the expense, many current digital cameras can also double as videoconferencing cameras when resting in their chargers.

Most cameras come with some form of H.323-compliant videoconferencing software built in (H.323 is the international standard to ensure that networked video cameras can interoperate). For serious use, however, you'll probably do better to look past these entry-level packages to software like Microsoft NetMeeting, a free piece of Internet Explorer that is probably already installed on your computer. If you're using Windows XP, videoconferencing is a core feature of the new Windows Messenger software.

Videoconferencing can be extremely effective in improving communications between members of a project team. Its value comes from its ability to convey the nonverbal cues — the hand waving, facial expressions, nervous tics and other gestures — that are said to comprise up to 70% of interpersonal communications. Using videoconferencing instead of a phone call can increase employees' retention of conversations from 40% to over 60%, according to videoconferencing trainer Sandra Sharer.

Just don't expect it to be like watching TV. Video is notorious for consuming your network resources, and while it is possible to transmit TV-quality videoconferencing, you'll do better to use lower-end gear that won't suck up as much bandwidth. Logitech's QuickCam Express USB, for one example, captures video at 352 by 288 pixels. This is about one quarter of the resolution of a PAL TV signal, but it is more than enough to suit most companies' needs.

Making the most of videoconferencing obviously depends on how you use it. It's hardly going to make a difference if most of your employees are sitting in close proximity and can just as easily stand up and walk 10m to have a face-to-face conversation. But if your employees are distributed across more than one floor of a building, if you have travelling or telecommuting employees that need to chat with peers in the office, or if your intranet links offices across town or across the country, videoconferencing is an excellent way to use your intranet as a highly effective means of communication.

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GLOBALISE
USES IM INSIDE AND OUT

Several years ago, an Internet recruitment company called Best People International began using instant messaging technology to communicate with potential candidates through its Web site. The technology quickly became endemic within the company, used both internally for communications between employees and also for communicating with customers.

Earlier this year, the company's directors sold off its recruitment business and renamed the company Globalise, retaining a core team of seven people that have been working to commercialise KUIconnect, the company's own version of Lotus' Sametime business instant messaging system.

KUIconnect is being marketed as a way for companies to provide secure instant communications with customers over the Web, a service that's widely said to improve customer loyalty and help increase the number of completed orders. It also includes a feature for automatically translating sessions between 14 language pairs, something that's attracted the interest of some large businesses with operations in different countries.

Globalise is also putting its money where its mouth is, using the IM client to keep its project team communicating regularly, even when members have a tendency to wander between customer visits, the office and home.

Although they could have done the same thing using free commercial services, Globalise director Steve Traurig (above) said the secure Sametime technology has been useful enough that it's worth paying for.

"Security is probably one of the most major things out there, and there's also some level of guaranteed service," Traurig explained. "We're using it internally in our building, for people who work from home, and even with one of our business partners. We're able to create instant online meetings where I reckon we save costs for travel, time and so on. In business, you realise that you have to pay for things to make them work well."

INSTANT MESSAGING

If you're one of the tens of millions of people who have already signed up for Web-based instant messaging (IM) services from Microsoft, AOL, ICQ, Yahoo or others, you already know how useful the technology can be. You can automatically keep track of your friends' comings and goings, then carry on real-time conversations that offer the immediacy of a phone call but cost nothing.

Now think about how this technology might help your business. Wouldn't it be nice to know when your co-workers are online, particularly if they're travelling and you haven't seen them around the office? How about giving your employees faster access to technical support, so they can ask questions about using their printer without wasting a system administrator's afternoon?

If you hold meetings using instant messaging, you can automatically record a transcript and post it on the intranet for future reference. Your receptionist could even use it to round up orders for the day's lunchtime sandwich bar run.

The problem is, free online services aren't exactly secure. You wouldn't want to be discussing company business in public forums, which is why many companies remain wary of general IM clients. To effectively use IM on your intranet, you need to be hosting the IM server within your own self-contained intranet.

INSTANT MESSAGING — THINK ABOUT HOW THIS TECHNOLOGY MIGHT HELP YOUR BUSINESS.

A growing number of companies now offer commercial-grade IM services. Lotus Sametime, Microsoft's MSN Messenger and aspirants such as Mercury Prime, Jabber, QuickSilver, Globalise, Ikimbo and Bantu are all contending for a business IM market that's expected to grow rapidly. And Sun Microsystems is partnering with consumer IM leader AOL Time Warner to build a business IM client in an effort currently called Project RAC (Real-time Asynchronous Communications).

By 2004, analyst firm Gartner has predicted a worldwide IM market of some 180 million people, with business usage accounting for a considerable portion of this.

Although they do cost money, business-focused tools solve many of the problems that have kept many companies wary of IM. They generally encrypt data for security, can be tied in with company employee directories to control access, and are rapidly being extended to other devices such as PDAs and mobile phones.

What you do with instant messaging is up to you. But with an increasingly mobile workforce and the availability of products suitable for business use, you should definitely consider how building an instant messaging community over your intranet could improve the way your business operates.

TRAINING

The potential for company networks to improve employee education has been apparent since the early days of computer networks, but early software's limited

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"LEGISLATIVE COMPLIANCE TRAINING HAS BEEN A HEAVY BURDEN IN TIME AND RESOURCES. WE COST-JUSTIFIED THE INTRANET, AND NOW ANYONE HOOKED UP TO [IT CAN] TAKE ADVANTAGE OF ALL [ITS] FACILITIES."

GMAC'S INTRANET TRAINING SLASHES SUPPORT COSTS

For automotive financier General Motors Acceptance Corporation (GMAC), an intranet training system has delivered demonstrable benefits by helping more than 200 Australian employees keep up with the latest developments in financial services legislation. Those employees use online training to comply with the Consumer Credit Code (CCC), which profoundly affects the business of GMAC and every other credit provider.

GMAC soon realised an intranet-based training system would be a cost-effective way to deliver consistent and repeatable training. Responsibility for content management was assigned to a single Webmaster, who formats and posts content provided by the company's training officer. The content, which is interactive but predominantly textual, includes many modules teaching prople how to incorporate CCC compliance into their job functions. There is also a wealth of third-party training for Microsoft Word, Excel and other productivity applications.

"The introduction of a uniform Consumer Credit Code required a common form of training throughout Australia," said Joanne Stubbs (above), chief information officer of GMAC's Asia-Pacific operations. "In the past, legislative compliance training has been classroom-based, which was a heavy burden in time and resources, and sessions were repeated regularly to meet demand. We cost-justified the intranet for that, and now anyone hooked up to [it] has the opportunity to take advantage of all [its] facilities."

GMAC's intranet also extends to offices in New Zealand, Taiwan, Indonesia, and China, thanks to the recent completion of a global WAN built by GMAC's US parent company.

The benefits of the system have been immediate and dramatic, according to Stubbs: "The initial return on investment was measured by the drop in calls to our help desk. We'd predicted they would fall by about 20%, but in fact, they dropped by 45% thanks to the training. There was also the cost benefit of not having to fly people around Australia."

capabilities initially held it back. Now, with intranets as standard fare, the business case for computer-based training (CBT) has become far stronger. It's so easy to provide interactive content to employees.

If your company's daily operations include complex procedures or specialised knowledge, providing online training over your intranet can be an excellent way of giving employees an easy-to-use encyclopaedia of job-related knowledge. And although it's now common for paper-based policy manuals to be accessible on the company intranet, it doesn't have to be boring: today's efficient Internet multimedia technologies offer new ways of communicating complex concepts to employees.

A car dealership might, for example, give workshop technicians a PC so they can call up streaming video that steps them through the process of fixing a particular part. A freight forwarder could prepare online video presentations showing employees how to properly fill in Customs forms. Or a restaurant could maintain a library of cooking presentations to help new chefs learn how to prepare standard dishes.

Five years from now, Gartner anticipates some 80% of the world's top 2,000 businesses will be using video on demand for training and employee communications. Jupiter Media Metrix believes company spending on on-demand streaming — for training and other uses — will reach US$1.9 billion ($3.8 billion) by 2005. In a recent survey by that company, streaming technology was already being used by 35% of respondents for employee education, and by 32% for sales training.

The tools to create streaming media are freely available and quality is good enough (particularly over high-speed intranets) that you no longer have to worry about looking bad. Add an interactive training system like WebCT — currently used by most Australian universities — and it's possible to set up full-service training, document management and self-assessment systems that will become indispensable tools for employees.

Not sure you have enough content to stock your intranet? Consider consulting with peak industry bodies or your technology supplier, who are likely to know of both industry-specific and general-interest training modules you can easily offer to employees. When building your training intranet, all the usual rules apply: start small, regularly gauge user feedback, and build up your training from there.

KNOWLEDGE MANAGEMENT

If you're still in the first generation of intranets, you've probably got a string of HTML pages with general information covering the company's background, weeks-old news bulletins, some generic PowerPoint presentations, and a few sales videos or pictures for downloading. You probably also tried to get everyone to make their own content, which means the intranet is a hodgepodge of writing styles and page designs.

Sound familiar? If so, it's time to revisit your intranet strategy to determine how it can do more than carry company announcements.

Used effectively, the intranet can become a one-stop shop for employees to

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ROCHE'S INTRANET PRESCRIPTION

With offices across Australia and a significant investment in both sales and marketing and R&D, pharmaceutical supplier Roche Products Australia has developed a considerable amount of knowledge over time. But with most of this knowledge locked in the heads of its 800 employees, Roche has, like most companies, struggled to share it in a way that benefits the entire company.

"WE WASTE AN AWFUL LOT OF TIME AND MONEY GETTING THE SAME INFORMATION. WE WANT TO KNOW WHAT WE DON'T KNOW, AND WE'RE BRINGING MORE OF A SENSE OF COMMUNITY TO THE ORGANISATION TO REDUCE DUPLICATION."

To this end, last year Roche began replacing its previous static intranet — built on an ad hoc basis by its global parent company — with an ambitious system that's just reached the end of its first phase.

For its new system, Roche has worked with Web development company Daemon, which has used Macromedia's Spectra Cold Fusion technology to develop a knowledge management system that allows employees to enter various information they find useful in their job. According to Roche's Internet development manager of the PharmaRx division Tony Grier (above), this information, available to other employees over the intranet, is hopefully helping save time and improve Roche's customer service.

"Knowledge is not power," Grier explained. "Sharing is power. People keep their spreadsheets, Word documents and PowerPoint presentations all over the place and we don't know what's in them. We waste an awful lot of time and money getting the same information again and again."

"Even if we can [capture the knowledge of] a secretary who knows where to get a short-run [promotional] puzzle done, that might save somebody 10 minutes — and that's good. We want to know what we don't know, and we're bringing more of a sense of community to the organisation to reduce duplication."

In its first stage, the company has built a responsibility hierarchy in which employees have been trained to create and post content online using Microsoft Word. The custom system also includes automated rules that govern approval of new content by relevant supervisors. The benefits of the new intranet are becoming evident over time, but Grier believes they will come in the form of intangibles such as better customer service and better-educated employees.

Over time, Roche plans to expand the intranet to every corner of its business — including delivery of training materials, document management, and direct employee access to Roche's administrative SAP R/3 system, which manages human resources and other information.

"The number-one objective is capturing what the organisation knows," Grier said. "It's an ongoing entity, and I envisage it will become a pillar application within the corporation within Australia. We're determined to make it something that will last for a long, long time."

access everything they need to know and do as part of their daily jobs. Instead of providing superficial fluff about your company, use the intranet to distribute actionable, valuable information. This should ultimately include access to more real-time information such as sales figures, data analysis, competitor monitoring, market announcements, and other important information.

At the very least, you'll want to give employees access to comprehensive information on products, business policies, sales procedures, customers, and other relevant information. Work out a responsibility structure that ensures experts in each field are generating and editing the content, but also provide some sort of review mechanism to ensure it's within corporate standards.

You may also find substantial benefits from building 'self-service intranets', which employees can use to access the information you have about them. For example, the intranet should provide access to human resources or payroll systems so workers can easily check up on their available leave and sick days, book rostered days off, apply for holiday time, change payroll details, and so on. These functions are typically provided within existing HR systems, so your challenge mainly lies in linking them with your intranet environment.

The key is to aggregate both internal and externally-generated information in order to provide something meaningful for each of your workers. While the speed and approach you take will clearly depend on your own company structure, you'll see immediate benefits if you begin to treat your intranet as a strategic tool instead of an outdated bulletin board. ■

intel

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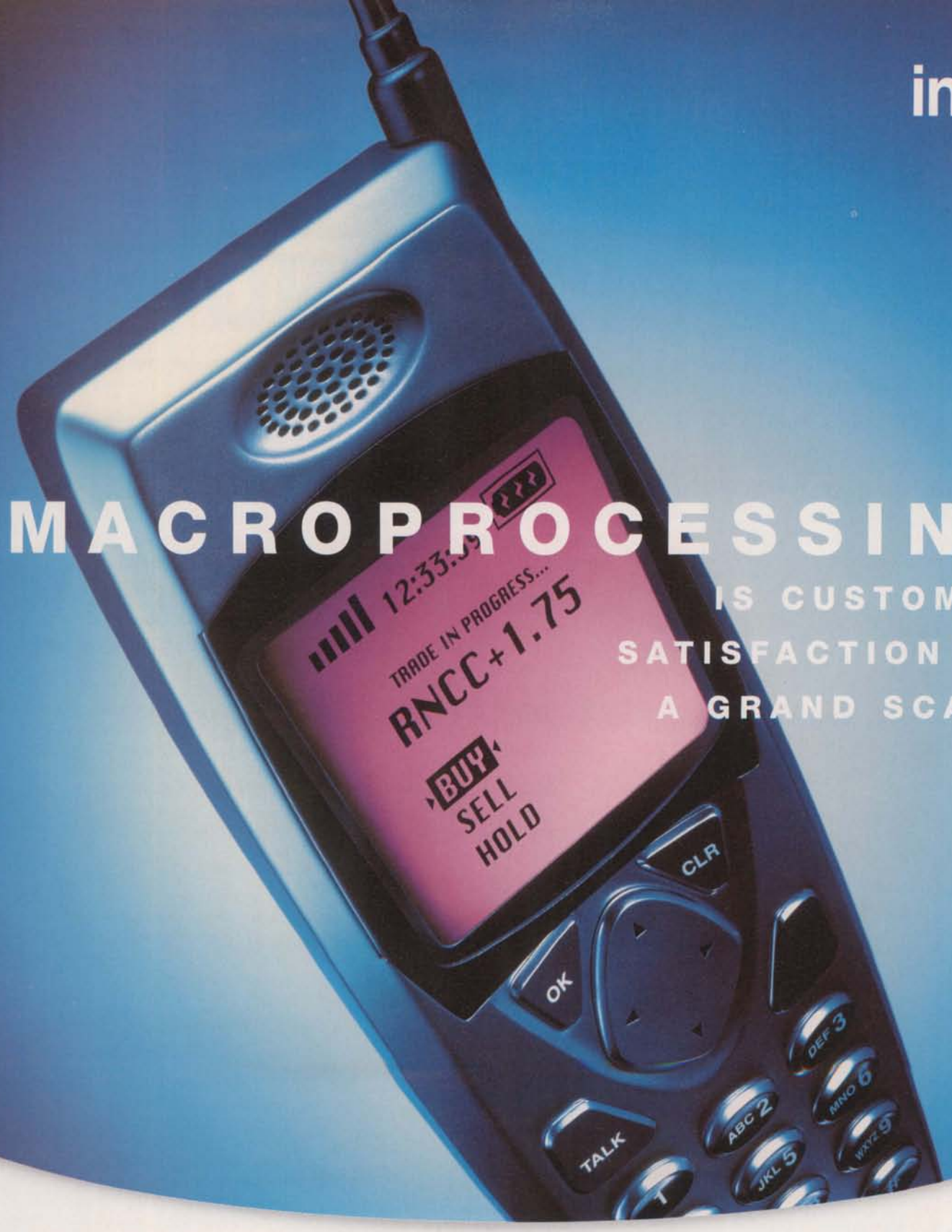

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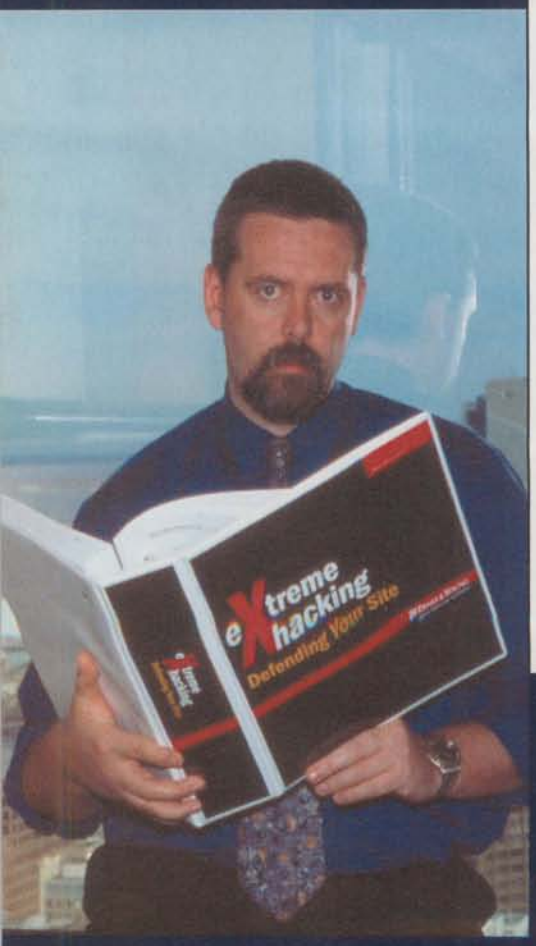
WEB CAREERS

BREAKING INTO

BY PHILIPPA YELLAND

PROFILE
DARREN O'LOUGHLIN



"ESECURITY PROFICIENCY IS TYPICALLY A RESULT OF MANY YEARS' EXPERIENCE."

Security services make up the fastest growing segment of the IT industry. IDC and Gartner Group reports suggest that, in line with US and UK trends, clients want IT security providers to maintain and support, as well as deliver, solutions. The field of managed services is growing overseas, and is on the verge of a boom in Australia. However, dealing with the digital threat is not simply about firewalls and passwords. Complex organisational issues, budgets, and staffing decisions are also involved. Management strategies are paramount.

According to Mark Rasch, senior vice-president of esecurity company Global Integrity, network intrusion is increasing. At present, 82% of successful attacks on corporate systems in the US are made by disgruntled employees or contractors, and the rest come from organised crime and hackers. In Australia, experts have identified an increase in external attacks. Darren O'Loughlin, of Ernst & Young's esecurity team, says Australia is following the US trend.

A report published in September in the US by the FBI's CSI (Computer Security Institute) reveals a 100% increase in outside system attacks in 2001, compared with the previous year. The real number is probably higher because, as CSI's director Patrice Rapolus says, less than half the corporate victims of cyber-crime inform the police.

Because the esecurity field began with network protection, it initially attracted people with networking backgrounds. Now, job descriptions are expanding to include specific requirements for server, application and desktop skills. Sometimes, in addition to computer science degrees, various 'soft skills' are important, and here's a surprise: fast, accurate touch-typing is increasingly listed as a prerequisite for security employment. (See 'Hard skills' and 'Soft skills', page 122)

Grant Slender, chief consultant with esecurity company ISS adds that security analysts and architects often have a background in auditing due to the risk-mitigation and policy-planning components of the positions.

INITIALLY, DARREN O'LOUGHLIN REFUSED TO follow his parents into the Victorian police force. As a young teen, he first became a baker, then a fitter and turner.

So how has he ended up head instructor for Ernst & Young's eXtreme Hacking course? O'Loughlin sees his early hands-on factory experience as extremely important. However, joining the police force as a detective was crucial.

While on the force, he upgraded his general computer knowledge (DOS Basic) by teaching himself Unix, Novell Networks, MS-DOS, and the just-emerging Windows platform. This enabled him to become a founding member of its Computer Crime Investigation Squad. Because Novell Networks allowed for very strong granular control of separate cases, it was essential to the secure network structures he implemented in this role.

O'Loughlin was in cyber-crime prevention for five years, leading covert and overt investigations, before being headhunted by Ernst & Young. "Because I'd designed the secure network for the police force, I was a prime candidate," O'Loughlin says. He sees computer

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THINK YOU'VE GOT WHAT IT TAKES TO MAKE IT IN ESCURITY?

YOU CAN START FROM EXPERIENCE OR WITH A DEGREE, BUT AN ESSENTIAL COMPONENT HAS GOT TO BE THE RIGHT ATTITUDE!

ESECURITY

A standard requirement in advertised positions is excellent communication and negotiation skills, because esecurity is about solutions, not computer policing.

At eSign Australia's $6 million high-security 'silo', security and management systems resemble a military installation. There are six tiers of access control and security, four of which are based on biometric technology such as hand scanning. All staff must pass background checks conducted by the Australian Security Vetting Service.

Police and programmers rub shoulders in this cyber-bunker. David Caldwell, security and policy manager, was a police officer for 19 years, and spent the past three and a half years working as head of the Victorian Police Computer Crime Investigation Squad, where he was involved in computer forensics and computer-related crime legislation.

Michael Kenny, project manager of technical infrastructure, has experience in disaster recovery. He worked in the Middle East and in London installing protective measures for stockbrokers subject to terrorist attacks. He also implemented security at Buckingham Palace, New Scotland Yard and high security prisons.

The diverse backgrounds of eSign's employees suggests that the company welcomes lateral thinkers with unconventional experience. Employers and consultants want people who can step into criminals' head-space.

Many attacks are low-level, and can be averted with simple precautions. Short, easy-to-guess passwords invite intrusion. Failing to check the identity of a new

WORKAHOLICS ANONYMOUS

HAVEN'T GOT THE TIME TO TAKE THIS TEST? WELL, MAYBE YOU SHOULD!

Mobile phones, laptops and pagers mean you can be at work even when you're not. It's easy to deny work addiction with claims that you're just dedicated. Liz Wedgwood, from TMP Worldwide, believes "Workaholism is the cleanest addiction — socially acceptable, while destroying physical and emotional health."

Tick those statements that are true for you.

- *I think about work constantly.*
- *I stay busy to avoid personal problems.*
- *Work is my main source of satisfaction.*
- *My personal life suffers because of work.*
- *I feel guilty when I take time off.*
- *I lose sleep over work problems.*
- *I take on more work than I can handle.*
- *Work has killed my social life.*
- *I hate having nothing to do.*
- *I work seven day weeks.*

Three or more ticks suggest you're a workaholic. (Source: TMP Worldwide)

"USE BASIC PRECAUTIONS, ENFORCE SECURITY, HAVE A STRICT PASSWORD POLICY . . ."

CRAIG ROWLAND

Many companies use an EAP (Employee Assistance Provider) such as Davidson Trehaire, which can be contacted on (02) 9283 2266, to help employees with problems related to workaholism.

► For more information, visit these sites: **www.cbs.curtin.edu.au/cbs/library/media/overtime.htm** *— research paper on workaholism and accidents.* **clubs.yahoo.com/clubs/recoveringworkaholics** *— mailing list for workaholics.*

forensics as cresting the esecurity wave. Investigators (or 'white hats') determine the size and impact of a security breach, maintain evidence continuity, recover the lost data, work out how the intruder entered, and — hopefully — find the perpetrators or 'black hats'.

"Forensic experts need to be qualified in both investigative and technical fields, and trained in countering cyber-crime," he says. The basics are to safeguard and preserve unaltered electromagnetic media, process and recover data as required, analyse the recovered data, and report findings. This may seem simple, but the tasks require knowledge in a wide variety of technologies, as well as legal and investigative issues.

O'Loughlin does not have a computer science degree. He sees his 16 years in the police force as a primary qualification, alongside industry qualifications such as Certified Checkpoint Security Administrator, Microsoft Internetworking TCP/IP and Verisign Certified Engineer. "Esecurity proficiency is typically a result of many years' experience honing technical and management skills, most of which aren't available from universities or courses," he says.

In the eXtreme Hacking course, he teaches esecurity staff "how to think like hackers". Because of its sensitive content, the course is only open to IT professionals nominated by their employers. "We want to help organisations defend their sites, not teach outsiders how to launch attacks."

Courses O'Loughlin recommends are Certified Information System Security Professional (CISSP) — www.isc2.org — and Global Information Assurance Certification (GIAC) — www.sans.org/giactc.htm. "It's the best move I ever made," he says. "My only regret is that I'm less hands-on these days."

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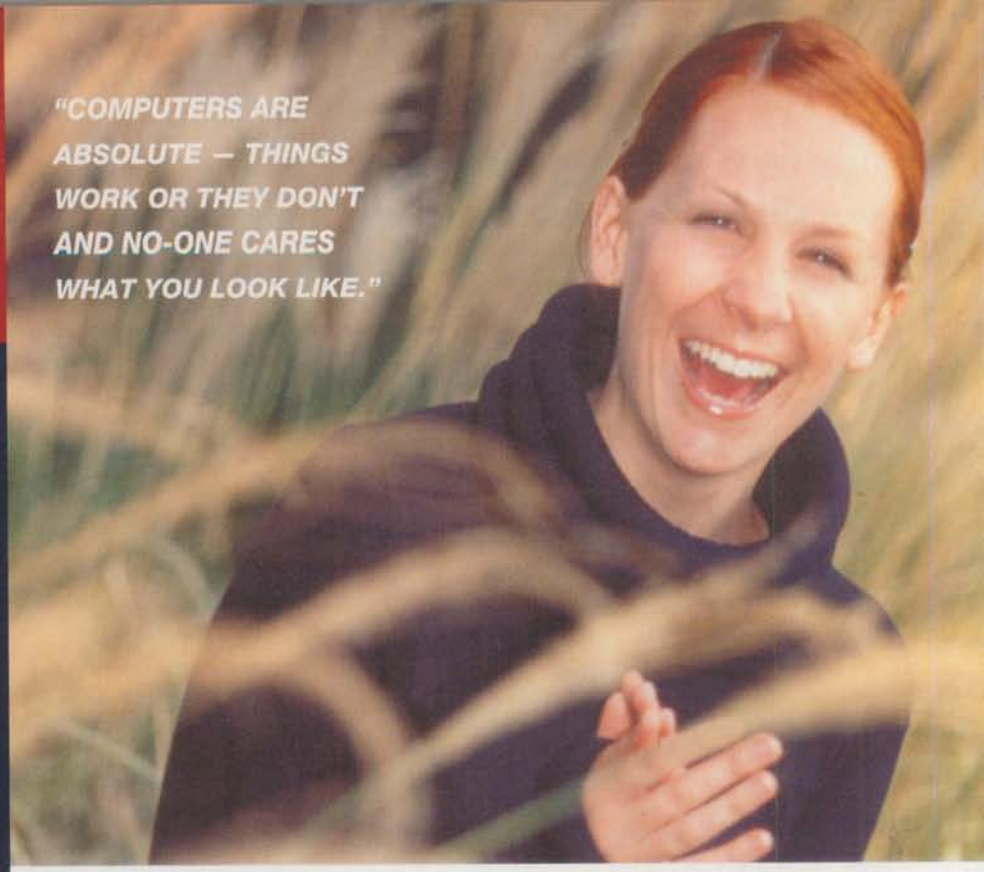
PROFILE

JUSTINE BONE



FROM BALLET TO ESECURITY HAS BEEN A LONG, satisfying jetè for Justine Bone. She's a member of the X-Force – an elite, anti-hacking unit within Internet Security Systems (www.iss.net) – and has just joined the select 50-member team in the US after a year with ISS in Sydney and two years as a security analyst with the New Zealand government's Communications Security Bureau.

Eight years ago, Bone abandoned her career as a professional ballet dancer to take a BSc in computer science at the University of Otago, then postgraduate study at the University of Canterbury.

"I was one of only two women completing the computer degree. I survived because I enjoyed the change from the catty, bitchy ballet scene, where decisions are subjective and apparently random. Computers are absolute – things work or they don't and no-one cares what you look like."

ISS came to prominence last year by cracking the ILOVEYOU virus, which caused US$6 billion ($12 billion) worth of damage. Christopher Klaus was still a student at Georgia Tech when he founded the company in 1994. Now ISS has almost 1,000 employees, annual revenue over $US100 million ($200 million), and a stock value of $US3 billion ($6 billion).

Bone's speciality is intrusion detection – watching a network, sounding a warning and taking protective action. She shrugs off suggestions her role is adventurous. "It's just software, and we're just engineers. It's not like we are in the parking lot having fistfights with hackers."

However, the SAS's Who Dares Wins ethos is evident in the Atlanta office: tattoos, shorts, baggy jeans, piercings, a half-mannequin, and Kalika, a hungry tarantula, crouching in a glass tank.

The X-Force consists of hackers – real ones: intelligent people who love messing with computers and software. Being good at maths is more important than knowing about computer security, but four years of experience will always beat four years of education.

ISS is emphatic about not hiring 'black hats' – cyber-crims. The company does extensive background checks on potential employees and fires anyone "who uses computer knowledge for evil, instead of good".

"The main thing is that I'm having heaps of fun," Bone says. She won't be drawn on her age, or on what she's paid, but admits she's "not making a bad living out of it".

secretary asking questions is dangerous. Craig Rowland, senior network security engineer at Cisco Systems says of intruders, "If you keep your doors and windows locked, they're much more likely to move on to an easier target. Use basic precautions, enforce security, have a strict password policy, implement staff education, do regular software patch maintenance."

In the ongoing battle against digital trespassers, two of the latest must-have weapons are digital certificates and cryptography. Firewalls were originally established to keep people out, but the growth of the Internet means some users need access to company networks. "The issue is how to prove people are who they say they are," Rowland says, "and digital certificates help."

Another area moving into the spotlight is Public Key Cryptography. A publicly available coding system and a long numeric 'key' are used to produce coded messages which can only be deciphered using a secret key. It is impossible to work out or guess the secret key, so messages are safe. ■

HARD SKILLS

'Hard skills' are considered essential for most esecurity jobs. They include:

Mainframe MVS, VSAM, COBOL, IMS, CICS, CB2, JCL, TSO, SAS

Mid-range AS/400, OS/400, COBOL, CSP

Client/server NT Server, Netware, Oracle, RS/6000, AIX, Unix, Internet, intranet, GUIs (PowerBuilder, Visual Basic, etc)

Desktop Windows NT, Windows 95/98, MS Office Suite, Lotus Notes, Novell GroupWise, MS Exchange, Visual Basic, Smalltalk, C++ and McAfee

SOFT SKILLS

Additional 'soft skills' are sometimes required. They include:

CheckPoint

Firewall

Sonic Wall Gauntlet

'Orange Book' Certification (Trusted Computer System Evaluation Criteria)

VPNS (Virtual Private Networks)

PKI (Public Key Infrastructure)

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NEW MASTERS OF FLASH: THE 2002 ANNUAL

DON'T PUSH THEM 'CAUSE THEY'RE CLOSE TO THE EDGE. *By Alan Crawford*

Flash is fast becoming the development tool of choice for young designers intent on turning Web browsing into a multimedia experience. A growing number of publications simply attempt to cash in on this newest Internet phenomenon, but *New Masters of Flash* is unique.

It's a highly advanced book aimed at professional designers, and it progresses rapidly through the more difficult and powerful aspects of Flash. Each of the 15 chapters is written by a creative Flash designer who shares their experience in developing Web content in a specialised area.

This approach makes for an unusually involved read in which entertaining narrative merges with highly technical guides. The topics range from combining graphics and scripting to the effective use of 3D and powerful programming techniques in ActionScript.

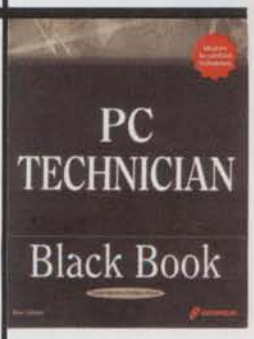
Clear explanation is achieved through the use of step-by-step dialog and brilliant presentation. The prodigious use of diagrams, art, colour photographs and screenshots results in a truly stunning computer book. But such glamour comes at a price — this is a seriously expensive book.

For advanced designers, this is money well spent — *New Masters of Flash* provides an interesting and enjoyable guide to Flash.

Publisher *Friends of ED*
Price *$141.95*
ISBN *1903450365*

PC TECHNICIAN BLACK BOOK

GRAB YOUR SCREWDRIVERS AND MAGLITE, WE'RE GOING IN! *By Darren Ellis*



The *PC Technician Black Book* is the ultimate guide to repairing, building and maintaining PCs. It is aimed at intermediate and advanced users, but as it's an amalgam of basic facts, background information and technical concepts, it also makes an excellent learning tool for beginners.

Each of the book's chapters is divided into two subsections entitled 'In Depth' and 'Immediate Solutions'. The first goes into detail about the background of the technology, including how it works, and the second lists problems and what to do when the technology fails.

The 'Immediate Solutions' will be most useful to the tech-heads out there, as they provide clear and concise descriptions of symptoms, why the computer is exhibiting those problems and how to analyse and fix them. These are clearly labelled and easy to follow. For instance, the motherboard boot process troubleshooting section is broken up into three sections: 'No Beep, No Boot', 'Beep, No Boot' and 'Beep, Boot, Bam'.

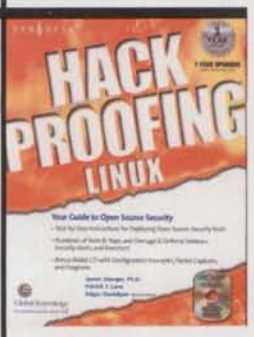
This may sound as if author Ron Gilster oversimplifies things, but he doesn't. Each component and process is described in meticulous detail.

Technicians in need of a handy reference for the workbench may find themselves seriously addicted to this book.

Publisher *Coriolis*
Price *$110*
ISBN *1576108082*

HACK PROOFING LINUX

BATTEN DOWN THE HATCHES — IT'S TIME TO GET SERIOUS ABOUT SECURITY. *By Mike MacCana*



This is intended to be a comprehensive security title, and it does cover such subjects as firewalling, content filtering, authentication, intrusion detection, encryption and Virtual Private Networks. Many books are available on these topics, however, and while *Hack Proofing Linux* is certainly detailed, it isn't comprehensive.

The content is tool-based, and clearly aimed at people who have at least two years of Unix/Linux experience, but it often indulges in lengthy explanations of how to perform basic tasks. At the same time, it provides very little information about important topics such as interoperability with other systems, security theory, network design and how systems are typically penetrated. These topics are well covered in titles such as *Hacking Linux Exposed*.

The book is applicable to most Linux distributions, but focuses on Red Hat for its examples. Also included is a business card-sized CD-ROM with the book's text in HTML, packages for the software tools used and sample configuration files.

Hack Proofing Linux provides a practical but limited guide to building and maintaining secure Linux systems, but there are more satisfying and comprehensive books available.

Publisher *Syngress*
Price *$122.10*
ISBN *1928994342*

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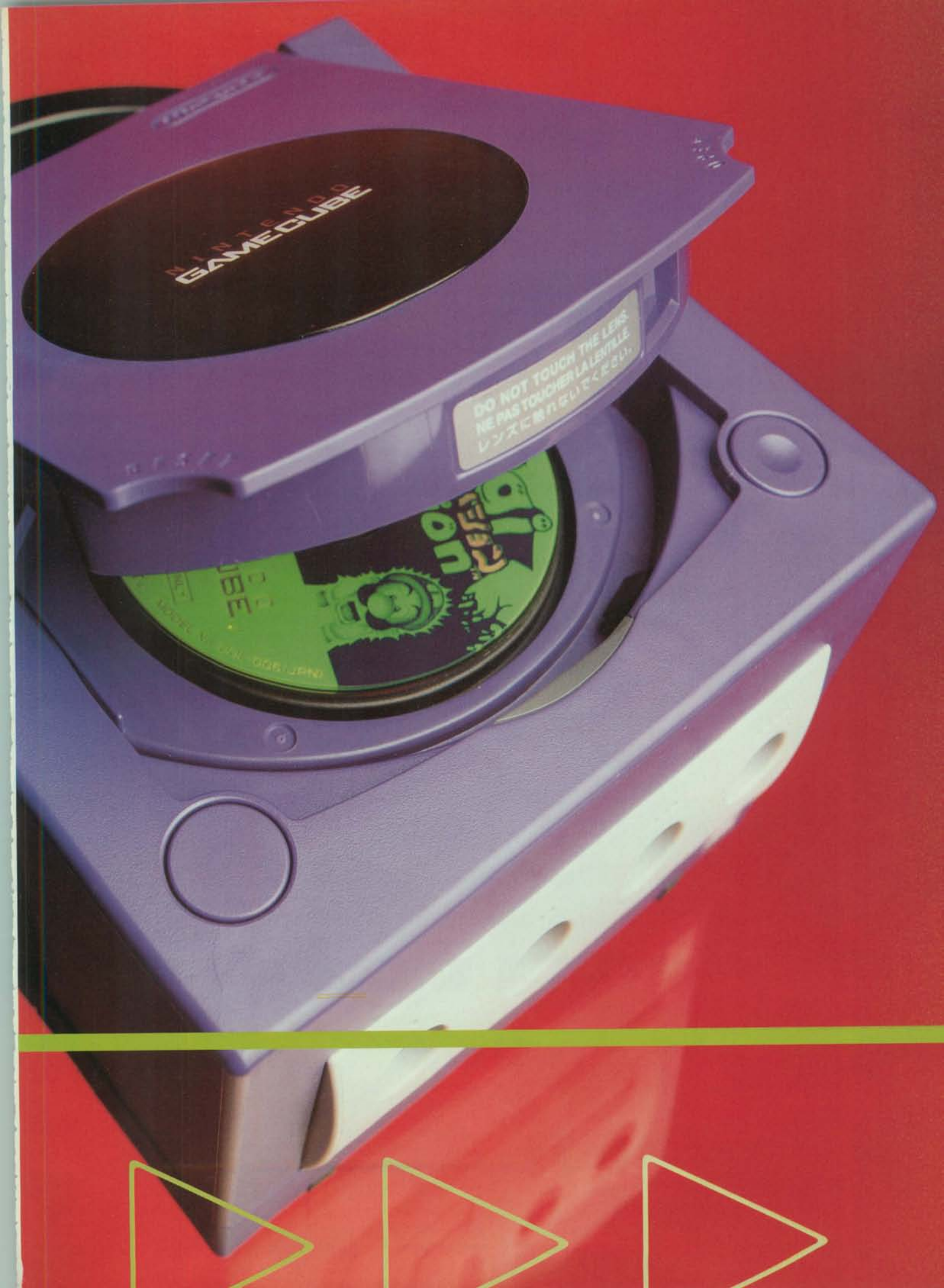
FUN³

EXCLUSIVE

BY KEVIN CHEUNG AND AMOS WONG

IT'S THE FIRST GAMECUBE IN AUSTRALIA, AND IT'S ALL OURS! *APC* MADE A SPECIAL TRIP TO TOKYO TO GRAB NINTENDO'S NEW 128-BIT SUPER-CONSOLE. SO, IS MARIO BACK IN BUSINESS?


NINTENDO
GAMECUBE
DO NOT TOUCH THE LENS
NE PAS TOUCHER LA LENTILLE

FOR DIE-HARD ADDICTS, ABSOLUTELY NOTHING beats the thrill of opening a brand new Nintendo console. It's been a long time between drinks for the company which, 15 years ago, taught us how to jump platforms and stomp mushrooms in Super Mario Bros. Nintendo is 'Gaming Royalty', period. It is one of the great innovators of the industry. That's why we headed to Tokyo for the 14 September release of the Gamecube.

The launch itself was a let-down. Unlike the PlayStation2's kick-off, where fans happily queued for days and nights in the middle of the biting Japanese winter, we barely had to stand in line. Not that it mattered. We grabbed our Gamecube from Tokyo's electronics mecca Akihabara, snatched up the requisite games, and headed for home — where we played through the wee hours to provide you with Australia's first hands-on road test of the Nintendo Gamecube.

The Gamecube is surprisingly small, but its size doesn't hit you until you see it side by side with another console. It measures 110 by 150 by 160mm, and uses a proprietary 8cm mini-DVD to store games. A sleek black handle along the back makes it look almost like a child's toy — an odd choice of design, as this is precisely the image Nintendo has been trying to escape.

Its 485MHz CPU — 'Gekko' — and custom graphics synthesiser ('Flipper') mean the Gamecube is more than a match for the PlayStation2 and its Emotion Engine. However, Nintendo has no intention of directly locking horns with Sony. The Gamecube does not play DVDs, and despite the existence of narrowband and broadband adaptors, Nintendo has ruled out online plans for the foreseeable future. It's a strict, no-nonsense games machine that sidesteps the popular notion of a 'set-top box'.

However, rather than trumpeting the power of its hardware, Nintendo is putting the focus squarely (sorry) on the games. With its unique mix of real-time strategy and Lemmings elements, Pikmin is capturing the imagination of gamers around the world. Games such as Kirby take inspiration from the classic Marble Madness, except that tilting the controller causes the whole landscape on the screen to tilt as well,

TAKING CONTROL

The ergonomics of the new controller are excellent: rounded shoulder buttons and handles are a perfect fit for fingers and palms. Incorporating buttons of differing sizes and shapes, the controller's arrangement means players intuitively know which buttons will be used for the primary action; it is more than symbols can convey. The shape, range of movement and springiness of the two analog sticks are perfect. As a result, Super Money Ball is much easier to play on the Gamecube than on the arcade version's banana-shaped stick. The analog shoulder buttons also include a digital click when pressed to their base, which opens up new gameplay possibilities for future releases.

GAMECUBE TECH SPECS

CPU: IBM 485MHz 'Gekko' chip
Graphics processor: Custom ATI 162MHz 'Flipper' chip
Memory: 40Mb 'Splash' (24Mb MoSys 1T-SRAM, 16Mb 81MHz DRAM)
Storage medium: 3in DVD-based 1.5Gb optical disc, memory card
Real World Polygon performance: 6 to 12 million/s (peak)
Sound: 64 audio channels, ADPCM and PCM encoding
A/V I/O: Analogue A/V out (composite, S-Video), digital A/V out (component, DTV)
Controller interface: Four control ports
External I/O: Two serial ports, one parallel port

LAUNCH DAY

The Gamecube touched down in Japan on Friday 14 September prompting early morning queues outside several major electronics stores around central Tokyo. The hardware cost the equivalent of about $430. Initially available in violet, there are black and orange models also planned for release. Video leads were sold separately for about $26, but digital and component video leads ($61) give superior images. Memory cards cost $24 and extra controllers were $43. Three games were available: Luigi's Mansion and Wave Race Blue Storm, both $117, and Super Monkey Ball, $100.

As the day progressed, however, it became clear that there would be none of the chaos that accompanied the PlayStation2 or even the Game Boy Advance launches.

Lines had dispersed by mid-morning and anyone could stroll into a shop and pick up the kit without having pre-ordered it. Gamecubes remained readily available throughout the weekend, but as two of the software titles are multiplayer, extra controllers were out of stock in some shops by Monday. In all, 174,856 of the 450,000 Gamecubes shipped were sold during the launch weekend.

SLIPPED DISCS

Gamecube titles come on a tiny disk measuring just 8cm in diameter. The same size as a CD single, the DVD-based format developed by Matsushita Electronics holds 1.5Gb worth of data. That's 190 times more than the cartridge-based Mario 64, the flagship release on the Nintendo 64. By comparison, PlayStation2 disks hold 4.7Gb and Dreamcast's disks are 1Gb. Instantaneous data access was the main advantage game cartridges held over optical formats, but loading times for Luigi's Mansion and Super Monkey Ball's stages were imperceptible. Wave Race took a little longer, but not annoyingly so.

allowing the main character to move around. What's more, the controller for this game is a Game Boy Advance, and Kirby can travel back and forth between the television and Game Boy Advance screen. Metroid Prime sees the return of one of the gaming industry's favourite sci-fi franchises, and the Legend of Zelda completely rewrites the book on how to create a fully animated appearance.

All of Japan's major third-party developers are queuing up for a shot on the Gamecube. Just before launch, Capcom dropped a bombshell by announcing that its entire Resident Evil series will now be exclusive to the Gamecube, and that the first Resident Evil is being completely remade. Namco is on board with Soul Calibur 2, as is Konami; and it's expected that even Squaresoft (whose move to the PlayStation constantly dogged the Nintendo 64) will mend its ties with Nintendo to make games for the Cube.

Anticipation about the Gamecube's future is electric, but its Japanese launch had none of the fanfare that surrounded the PlayStation2. The modest debut has been attributed to a number of factors, the first being that there were only three games at the time of the launch. Despite Luigi's appearance, a bona fide Mario title wasn't among them. The terrorist attacks on the US a week earlier also had an effect.

The slow start doesn't seem to have affected anyone's expectations for the Gamecube's Australian release, which is expected around March or April next year.

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THE GAMES

SUPER MONKEY BALL

It sounds so easy. The left analog stick tilts a floating platform to varying degrees, rolling a bubble-bound simian who must pick up bananas and reach the goal within a time limit. But stages are designed to maximise opportunities to send your character rolling off the edge, so even the tight and responsive control is small consolation. Advanced levels are incredibly tricky, requiring Zen-like concentration and thumb movement precise to the micron!

Four-player competition is outdone by new multiplayer party games that include racing (Mario Kart-style) and even target parachuting. Best of all is Monkey Fight, which arms contestants with a boxing glove to slug opponents off the stage. Billiards, golf and bowling mini-games can also be unlocked, the latter cleverly using the analogue shoulder buttons to adjust spin. The game's developer, Sega, has delivered an addictive title that's vastly superior to its original arcade incarnation, and arguably one of the most accessible and fun party games to date.

LUIGI'S MANSION

Inviting friends to a housewarming at his recently won mansion proves to be a major faux pas for Luigi. The place is haunted! So when Mario disappears, it's time for a search and some ghostbusting. Ghouls must be stunned by torchlight, then hoovered up with a vacuum. The control pad's rumble greatly enhances this experience.

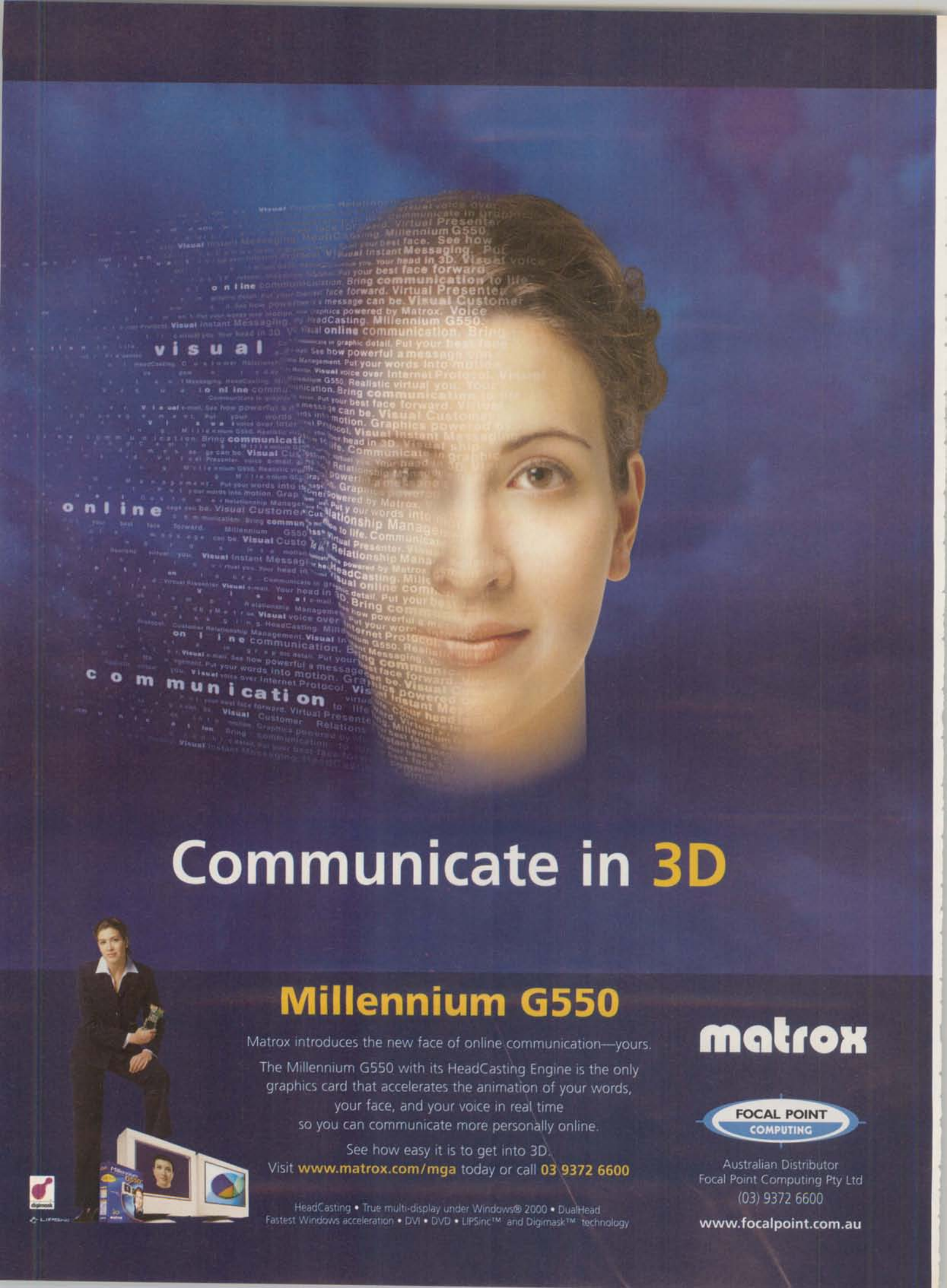
De rigueur Mario game items such as coins, bills and powerups (not to mention loads of dust!) are uncovered by pointing the vacuum at furniture or giving objects a shake. Keys to unlock other rooms are awarded when all the ghouls in an area are vanquished.

Analog controls are clearly the future of gaming, as they allow precise and nuanced gameplay. The left stick moves Luigi, and the right controls his torch and the direction of his vacuum; applying pressure to the sticks varies the speed of movement. With ingenious puzzles and brilliant graphics, lighting and special effects, Luigi's Mansion is immensely entertaining.

WAVE RACE BLUE STORM

Right from the loading screens, Nintendo's jet ski racer sets a benchmark for the realistic depiction of water physics and effects. You select from eight characters with differently tuned machines, and thanks to the controller's rumble pack, the sensation of jet skiing is very convincing. Courses range from detailed tropical and arctic settings, to a city harbour at night. Differing weather patterns realistically affect the water and level of difficulty. No detail is spared; splashes and rain even blur the screen.

The game's depth lies in augmenting your efforts with various tricks like handstands, dives and fancy jumps. The button/stick combinations are surprisingly easy to learn and execute, thanks to an excellent training mode. The skills can be put to good use in Score Attack, where trick points are accumulated, but the real test is winning the championship race with flair. Throw in a four-player battle and the game is unbeatable racing fun.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TARGET X

SEGA MAY HAVE THROWN THE FIRST punch in the next-gen console war, but the Dreamcast was soon KO'd in what is now a three-way brawl. Sony was quick to pull on heavy gloves with the PlayStation2. Nintendo has also entered the fray. Now it only remains for Microsoft to lace up the ring boots.

Big M is a latecomer to the field, but the company is deadly serious about the Xbox and about its desire to become the dominant force in the video games industry. It cut a lot of the red tape out of the game-making business and made the system friendlier for third-party developers. Yet even with close to $1 billion of marketing muscle and hardware specs (see 'Inside Xbox') that makes Xbox the most powerful video games console in the market, there are doubts about whether it will take off. No US company has produced a successful games machine since the Atari 2600.

Graphics power is what counts. Xbox is a texturing beast with a maximum resolution of 1,920 by 1,080 (compatible with HDTV), and options to play games in progressive scan. The unit also features a Dolby Interactive Content Encoder (DICE), which allows the use of Dolby Digital 5.1 surround sound in real time. Behind all this is a 10Gb hard disk, a broadband Ethernet adaptor, and for a little extra dosh, a remote control to watch DVD movies.

Microsoft would argue that what's important is games, and that's why the company has been pitching its platform so aggressively to game developers. Communication flows have been streamlined so that there are minimal delays between Japanese and European launches. Tech support, programming guides and other texts are literally translated from English on the fly. And best of all, since it is basically a locked-down PC that cannot be upgraded, the Xbox is highly accessible for all programmers.

Gaining support from American and European developers was easy, but Japan is proving to be a challenge. Number one, the Xbox is too big. It's about the size of a VCR. Microsoft made some headway by opening a dedicated office in Japan and then securing software support from heavyweights Sega and Konami. Developers such as Squaresoft are staunchly uncommitted. However, now that the Gamecube has been launched, and its appeal and potential are plain to see, the Xbox is losing some of its allure.

There's already a huge selection of games in the pipeline: Munch's Oddysee, a quirky platform game out of the Abe's Oddysee universe; Project Gotham, an impressive racing game from the makers of Metropolis Street Racer; and Halo, a hardcore futuristic first-person shooter. Sega will be releasing a series of titles with its psychedelic arcade flavour, such as Gun Valkyrie, Jet Set Radio Future and Sega GT 2002. There will be about a dozen titles available at the launch in April next year.

Although impressive, these games do not appear to possess the knockout qualities needed to sell systems. Nothing has been developed so far with enough kick-butt appeal to scream 'Xbox!' in the same way that Gran Turismo screams 'PlayStation!'.■

INSIDE XBOX

CPU: Intel 733MHz chip
Graphics processor: Custom nVidia 250MHz 'XGPU' chip
Memory: 64Mb unified RAM, 200MHz DDR
Storage medium: 2x to 5x DVD-ROM, 10Gb hard disk, 8Mb memory card
Theoretical Polygon performance: 125million/s
Particle performance: 125 million/s
Sound: 64 audio channels, 3D audio support, DICE-enabled game audio
A/V I/O: RF, composite, S-Video, component (480p, 720p, 1080f)
Controller interface: Four control pad ports
External I/O: DVD kit, broadband adaptor

PC

ARCANUM: OF STEAMWORKS AND MAGICK OBSCURA

WATCH MAGIC CLASH WITH TECHNOLOGY IN THIS UNIQUE RPG FROM TROIKA.

By Daniel Gardiner

Addiction barely describes it. This is one of those games you find is constantly on your mind — even when you should be concentrating on other things. Like working. Or eating. Or sleeping.

Arcanum is what every good role-playing game should be — expansive, detailed, original and fun.

Its basic premise is simple: take a Tolkienesque fantasy RPG (filled with the usual array of elves, dwarves and wizards), then fast-forward it into the industrial age. Swords and sorcery now have to vie with steam engines and shotguns.

This conflict permeates every aspect of the game, from selecting a character to the nature of the world of Arcanum. Magic and technology are incompatible: where one exists in abundance, the other cannot survive.

At heart, it's a fairly stereotypical PC RPG — you create a character, gain some followers and slay lots of monsters. It's the attention to detail, however, that sets Arcanum apart.

Character interaction is a great example of Arcanum's originality. In most current PC RPGs, character class, race and stats make little difference to the way NPCs approach and converse with you. Not so in Arcanum. Your half-ogre with exceptionally low intelligence will only communicate with other people using (often humorous) monosyllabic sentences punctuated with grunts. These small touches add to Arcanum's charm, and make it great to play again.

A good balance is maintained between talking to other characters and romping through dungeons. By default, combat is real time. It mimics recent hits such as Diablo II and Baldur's Gate II — not groundbreaking, but fun.

The game is amazingly expansive. There are masses of side-quests and dungeons, and the main plot has many twists and turns.

Arcanum also comes with the development tools used to create the game, making it possible to create your own quests, or hook up with the numerous fan-based projects online.

Troika Games has taken an interesting concept and turned it into a great RPG. ■

Online *www.arcanum1.com*
Price *$89.95*

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ANACHRONOX

A hybrid of console and PC RPGs, this is a comic-style sci-fi adventure. It's not quite up to Final Fantasy standards, but it's a lot of fun.

Online *www.anachronox.com*
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CONQUEST: FRONTIER WARS

Many have overlooked this great title, but fans of the RTS genre will kick themselves later if they miss it. Conquest neatly combines elements from strategy greats such as Homeworld, StarCraft and Ascendancy in a unique and fun RTS. Be sure to check out the demo on this month's CD set.

Online *www.ubisoft.com/conquestfrontierwars*
Price *$79.95*

HOSTILE WATERS: ANTAEUS RISING

This real-time strategy game's individual unit control in first-person mode makes it a hybrid RTS/FPS. Fun, fresh, but single player only.

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Price *$79.95*

make no mistake,

THIS IS AN ADVERTISEMENT

It may look a little different to most but then the product it is advertising is rather different. It's the EX21 Transformer digital video/stills camera from Panasonic. What sets it apart is its ability to pull apart. Slide the base off the Transformer and you have a superb digital stills camera. Slide it back on and you have an equally superb digital video camera. So no matter how you use it, the Transformer always feels like a stills camera should. Or a video camera should.

GEE, THAT'S AMAZING

Even though the Transformer weighs in at a mere half kilogram, it's heavy on features. The lens is a Leica Dicomar with a MEGA PIXEL CCD capable of recording images with brilliant razor-sharp 1,080,000 -pixel resolution. The 10 x optical zoom is capable of magnifying images with no degradation in image quality. While Panasonic's Super Image Stabiliser ensures clear, crisp images even when shooting on the move. Yet for all this, the Transformer fits comfortably in the palm of your hand. When it comes to video, the Transformer records vivid high-quality images on DV tape. You can even convert your old analogue videos into the clearer more versatile digital form thanks to an Analogue In/Out terminal. To make it easier the Transformer records data onto a large capacity, fast-access SD Memory Card.

SO WHAT'S AN SD MEMORY CARD?

It's a versatile, large capacity storage card that allows you to record still images and high-compression MPEG4 movie format that is ideal for emailing. It also makes transferring images to your PC or printer far easier through a digital terminal (USB) and connecting cable that suits most PCs. In keeping with its split personality, the Transformer also doubles as a handy dictaphone. The Voice Recording Function features a high-performance microphone that provides superb digital sound so you can record accurate records of meetings direct to your SD memory card. It is Bluetooth ready which will provide short range wireless connectivity so you can transfer images to some PCs without connections. And Panasonic's low-power consumption design means you can operate the camera for up to an hour on the standard battery. All of which leaves us with little else to say than to see your nearest retailer to check out the brilliant digital EX21 Transformer for yourself. Or, if you'd like further details call our Customer Care Centre on 13 26 00 or visit www.panasonic.com.au today. PSC0029/APC

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PS2

TWISTED METAL: BLACK

CITY-WIDE DESTRUCTION DERBIES RULE THIS MONTH'S NEW PLAYSTATION2 GAMES AS TWISTED METAL: BLACK GIVES NEW MEANING TO THE WORD 'CHAOS'. *By Kevin Cheung*

For more of the latest games reviews, visit ***www.apcmag.com/games***

You haven't played a destruction derby game until you've played Twisted Metal: Black. It's fast, chaotic, bigger than anyone could have possibly anticipated, and executed to perfection. Gone are the days of racing around dirt tracks and enclosed arenas in battered old jalopies — Twisted Metal: Black is all about waging war in the streets.

The levels are impossibly huge. You can spend 15 minutes battling on a single stage and not once encounter the boundaries. In one stage, a criss-crossing network of freeways and overpasses leads to an open dirt field, where you'll find interconnecting sewage pipes and storm drains. These alternative paths take you to a handful of other locations, including a football stadium that's under construction. Another level places you in suburbia, where fibro houses, telegraph poles and trees stretch as far as the eye can see.

The levels are stocked to the hilt with detail. There are road signs, bus stops, fences, glass, construction materials, pedestrians, and cars trying to get out of your way. And we're not talking about static objects rendered in low resolution — the objects are all clearly defined, and you can smash through virtually everything you see, including houses and football stadium seats.

Amazingly, despite its immense scale and detail, Twisted Metal: Black is locked at 60 frames per second. This guarantees seamless motion, which makes it much easier (and more fun) to play than original PS versions that chugged along at an inconsistent rate of 30 or less frames per second.

There are two modes: Story mode and Endurance mode. The latter puts you through a series of one-on-one battles in a given stage. Every vehicle comes with a machine gun, but you can also collect weapon orbs scattered around the field. These include fire bombs, homing missiles, Molotov cocktails and satellite-controlled rocket systems. Sure, this mode of play sounds a little old-fashioned, but a good performance is rewarded with new vehicles and tracks to play on.

The Story mode is where the real fun is, pitting you against up to seven other computer-controlled players. They're tough to beat, they know exactly where all the power-ups and hidden paths are, and they slam you with everything they've got. Suddenly, having three lives per match isn't that big an advantage. You'll still be desperately searching for health bonuses. Multiplayer mode only allows for two players, which is a shame, since a four-player mode would make it a more competitive game. ■

Online *au.playstation.com/mini_sites/tmbpage1.jhtml*
Price *$99.95*

RESIDENT EVIL CODE: VERONICA X

The latest chapter in this survival horror series is as scary as ever. It's also fully rendered in 3D.
Online *www.capcom.com*
Price *$99.95* FULL REVIEW ONLINE ▷

TIME CRISIS 2

Duck for cover, reload, then shoot the baddies on the screen with the new PlayStation2 light gun. Namco's sequel to PS's popular shooting game is arcade perfect, and has an option to play in two-player mode, or one player with a gun in both hands.
Online *www.au.playstation.com*
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MAX PAYNE

The Matrix-style shoot 'em up game that's been burning up the PC chart is now on the PlayStation2. Come get some.
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JUST FOR FUN

THE MYSTERIOUS LINUS TORVALDS: CORPORATE TITAN-TOPPLER OR GOOD-TIME GEEK? *By James Riley*

There's a web of intrigue behind the development of the most popular operating systems, and anyone who likes to watch techno-political warfare for sport will enjoy Linus Torvalds's autobiography, *Just for Fun*.

Torvalds, of course, is the man behind the Linux operating system. His book, written with Red Herring executive director David Diamond, is full of gems, particularly regarding the history of the open source movement.

Linux, for those living under the proverbial rock, is an open source operating system. It hasn't revolutionised the global IT industry, as Linux devotees might think, but it's come as close as any operating system can, and the momentum behind it continues to grow.

For fans of the Linux operating system — and there are many millions around the world, a large proportion of whom are in Australia — *Just For Fun* is a must. You will love it, especially as Australians figure prominently. Torvalds credits several breakthrough developments that were incorporated into Linux to Australian developers.

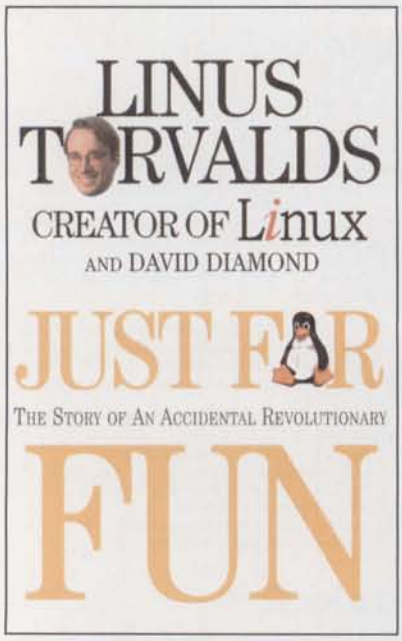
Software developers have long been divided over how software should be designed, and how its 'ownership' should be treated. On one hand, the open source movement advocates that source code should be made available to everyone and should be free from restrictive licensing. This lets other developers modify programs to suit their needs, which, they say, accelerates progress. The other side of the argument generally comes from the corporations, who control intellectual property strictly through various legal means. Bill Gates, naturally, personifies the Dark Side to Linux devotees.

Just For Fun can be annoying in parts: co-author David Diamond plays a journo-as-superhero role, in a manner more suited to the puff journalism of magazines like *Rolling Stone* or *GQ*. Apart from that, however, this is a fascinating insight into the story of Linux.

Torvalds has long been portrayed as the poster boy of the open source movement. He's not, however, and he spends much of this book explaining his personal open source philosophy, which isn't as radical as many believe. This is the real value of *Just For Fun*. It is a complex issue, and Torvalds has spent plenty of time in the trenches. His writing style is fluid and easy to read, and there are warnings throughout the book to tell non-geeks which chapters to avoid.

It's about time Torvalds wrote a book, because in the history of the industry, Linux and open source are worth more than a chapter. ■

Publisher *Texere*
Price *$49.95*
ISBN *1587990806*



He was only playing, and look what happened!

COMPUTINGFAILURE.COM

Learning from other people's mistakes is usually cheaper than making your own, and this book presents plenty of war stories from last year's tech wreck. Despite the US focus, the lessons are widely applicable.

ComputingFailure.com could be useful for anyone who thinks there's a quid to be made out of ecommerce. It's also a good read if you take pleasure in other people's misfortunes.

Publisher *Prentice-Hall PTR*
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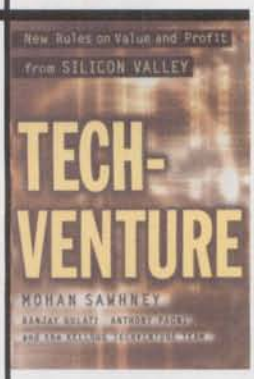
TECHVENTURE



This book is a collection of MBA papers that examine a wide range of topics. The writing is diverse and demonstrates leading-edge thinking, and only occasionally does it lapse into dryness.

TechVenture is good reading for executives and entrepreneurs who are searching for unique insights into the new economy.

Publisher *John Wiley & Sons*
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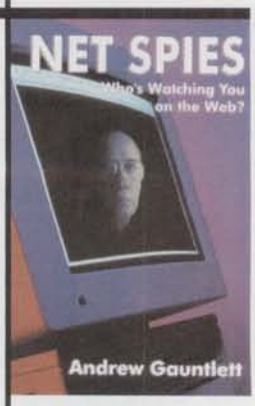
NET SPIES



Net Spies broadly outlines issues involved in personal privacy and data protection and provides useful warnings to users of common Net-based money-making scams. It targets industry beginners and has useful tips for securing a PC.

Experienced users need not apply.

Publisher *Vision Paperbacks*
Price *$29.95*
ISBN *1901250253*

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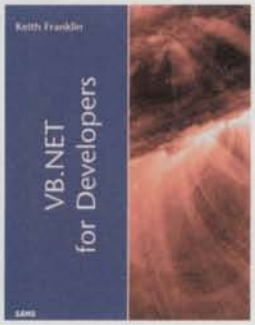
This book provides developers with detailed coverage of Microsoft XML technologies and their practical applications in developing .NET web applications. **$84.95**



This comprehensive book takes an in-depth look at the new and enhanced features of VB.NET and provides the professional developer with the knowledge needed to build real-world applications and fully utilise the power of VB.NET. **$84.95**

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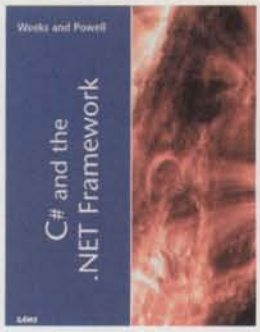

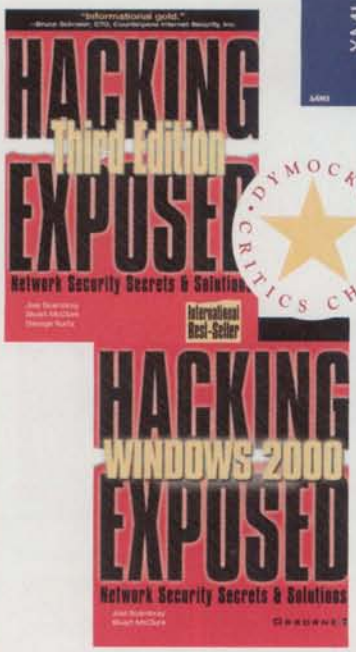

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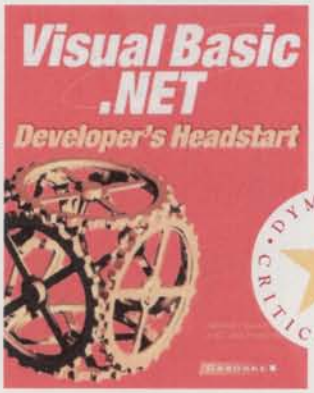
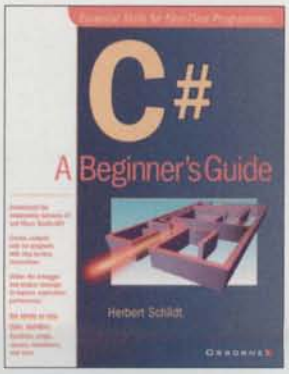
Hacking Exposed Windows 2000 uncovers Windows 2000 vulnerabilities while providing administrators with concrete security countermeasures. Both books detail the latest denial of service attacks, email attacks, viruses, & web hacks, and coverage of the new version of Windows XP Server. **Also includes a bonus CD with custom scripts and tools. $89.95 each**

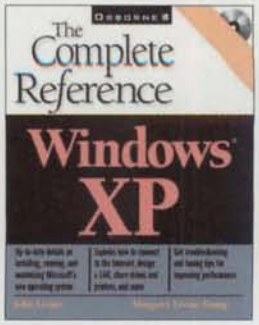


DYMOCKS CRITICS CHOICE

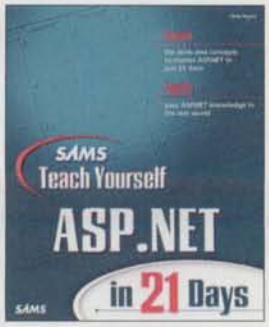
This book will smooth the transition to Visual Basic.NET and help developers understand the paradigm shift presented by the NET Framework. Key differences between VB 5 and VB.NET will be highlighted in the code samples. **$44.95**



Get up and running fast with this great beginner's guide to C#. Learn to create, compile and run programs with step-by-step instructions and learn how to utilise the debugger and project manager to improve an application's performance. **$54.95**



This complete reference explains how to connect to the Internet, design a LAN, share drives, printers, and much more. This one-stop resource also has tips on how to improve performance and help with troubleshooting. **CD-ROM included. $74.95**



The perfect book to introduce beginner and intermediate readers to the new technologies and frameworks presented by ASP.NET. By guiding readers through short but increasingly complex lessons, this book provides a strong foundation in ASP.NET. **$84.95**

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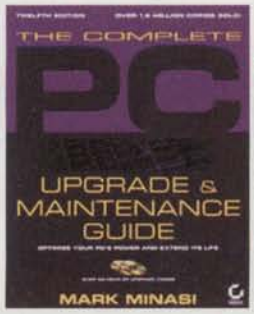
The latest edition of Mark Minasi's bestselling title is the one book no professional, student, or serious home user can afford to be without. For this month only, **Dymocks is bundling it with the Sybex *e-trainer*: A+ *Certification* free**. It's a one-stop reference for the beginning A+ student or anyone looking for a clear explanation of computer hardware, software and networking. **Bring this coupon into your nearest Dymocks bookstore to buy your copy for $140.00. Includes the free $115.00 software package.**

DYMOCKS CRITICS CHOICE



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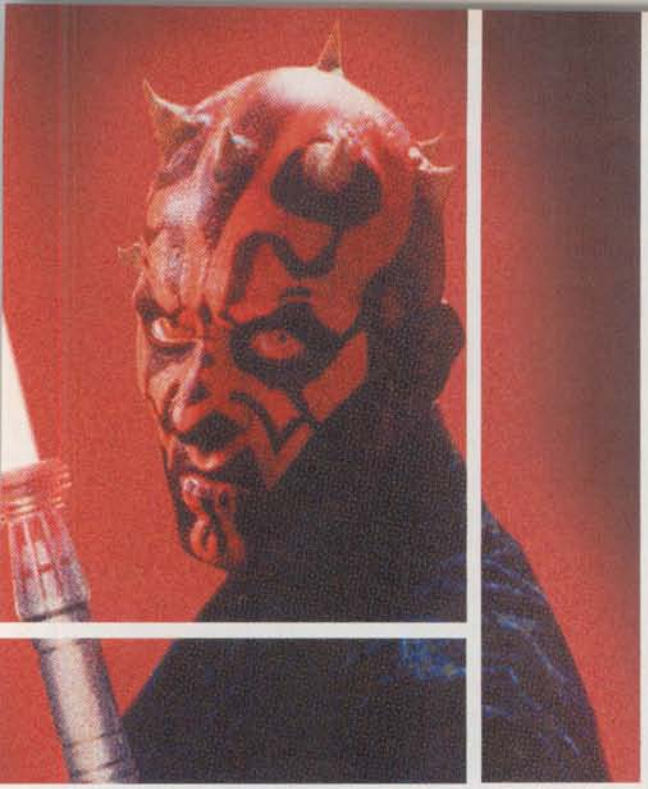


STAR WARS EPISODE 1: THE PHANTOM MENACE

EPISODE 1: THE PHANTOM MENACE WAS FILMED IN SUCH A WAY THAT THE EVENTUAL DVD RELEASE WOULD BE A REAL TREAT FOR FANS. *By Darren Ellis*

This highly anticipated film received a mixed reaction from fans, as well as newcomers to the Star Wars universe, when it first appeared on the big screen. Many derided the stilted acting and poor script; others loved the special effects and dioramas. All united in loathing Jar Jar. Let's face it, when you add to a well-loved 20-year-old franchise, you're going to step on some toes.

Fortunately, *The Phantom Menace (TPM)* double DVD set goes a long way towards appeasing the critics. Is *TPM* a good movie? No, not by a long shot; but there's so much on the DVDs that you can forgive the failings.

VIDEO

Presented in anamorphic widescreen (2:35:1), the movie is a joy to watch, especially during the grand sweeping shots of Naboo and Coruscant. The original movie had already been digitised for some of the new digital theatres in the US, so it's no surprise that the 'transfer' here is perfect. The colours are rich and vibrant, from the green fields of Naboo to the yellow sands of Tatooine. This clarity presents a problem, however: it highlights the fact that the spacecraft are merely digitised special effects.

AUDIO

The audio on these DVDs is superb. The soundtrack was remastered by THX and supports Dolby Digital 5.1 EX and Dolby Surround 2.0. Particular attention has been paid to the surround sound aspects of the movie, and the background noises and atmospherics are crystal clear without detracting from the main soundtrack. The markets at the Mos Eisley spaceport provide an excellent example — you really can hear the droids and creatures around you.

EXTRAS

There's very little room left on either DVD once all of the extras have been added. Disc one presents the movie in its original format, and also has a commentary track featuring George Lucas and Rick McCallum, plus Ben Burtt and others on the special effects and production teams. This is great for hearing their spin on the movie-making process. For a different perspective — one that shows how fluid that process can be — take a look at 'The Beginning' on the second DVD. This hour-long documentary was apparently constructed from 600 hours of raw footage shot whilst *TPM* was being made, and includes some fascinating scenes, in particular, the script rewrites and important character and special effects decisions made on the fly.

The second DVD also includes seven scenes cut from the cinema release, but completed for the DVD (which saves you watching actors in front of blue screens), along with short features and animated storyboards. You also get the 'Duel of the Fates' music video, trailers, posters and Web-umentaries as seen at **www.starwars.com**. ■

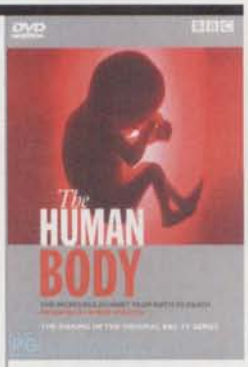
***Price** $49.95*

Not a particularly good movie, but an excellent DVD — the quality and extras are outstanding.

THE HUMAN BODY

This excellent documentary tracks the path of human life, from conception through to old age and death. Using incredible special effects and camera work, the six-part series comes on two DVDs, with a 'making of' documentary on a third disc.

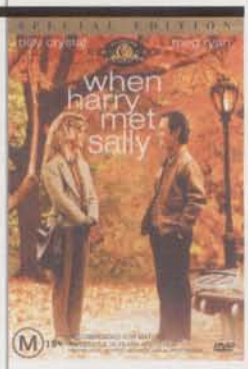
***Price** $69.95*



WHEN HARRY MET SALLY
SPECIAL EDITION

This edition includes an audio commentary from Rob Reiner, deleted scenes and a music video. The best part is another 'making of' documentary, which features interviews with the stars and production team.

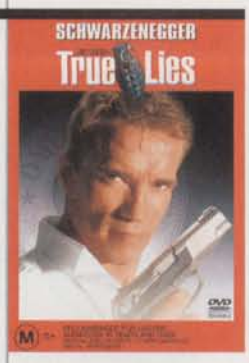
***Price** $36.95*



TRUE LIES

There's nothing special about this DVD, but if you like your Arnie action loud, then it's a great disc to own. It's one of those films that's best played on a big screen with 5.1 sound cranked up. Anyone for blowing up the Florida Keys bridge?

***Price** $36.95*



WEBFILE GO SITE-SEEING

SNOPES

www.snopes.com

Snopes is more than a massive archive of urban legends. It's a library that throws into doubt every story you ever thought was true. The research is vigorous and updated daily, based on current events. For example, the terrorist attack on New York spawned a couple of false stories reported as fact by mainstream media. Put in any keyword that relates to a yarn you've heard over the years and see what Snopes has dug up. There's also an ace mailing list to join that features discussions on anything from quirky news to lists of anagrams for Osama bin Laden (Is a banal demon).

Garth Montgomery

MARVEL COMICS

www.marvel.com

Imagine being drawn into a surreal dreamscape where tales of life and death unfold in words and pictures. That's Marvel Comics. Once banished to school yards, comics are now considered art, and sophisticated Flash animation is being used to give them new life. Marvel's 'comic' media player is well worth trying, as is a subscription to the Daily Dilbert.

Fiona Angus

TOM'S HARDWARE

www.tomshardware.com

Begun by a German doctor with a passion for IT, Tom's Hardware rapidly grew into the technologist's bible — with everything including in-depth analyses of processors and video cards. Sometimes too technical or evangelistic, the site offers some real gems, such as the feature in which the heatsinks were pulled off CPUs to see how long it took them to overheat.

Darren Ellis

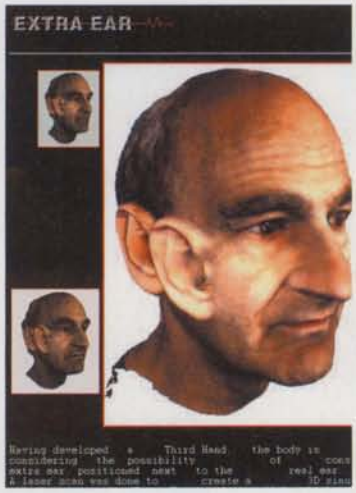
PCMODS

www.pccasegear.com

Does your new PC look a bit boring? Try splashing out on some super-cool 'mods' like a jet-black aluminium Lian Li case and neon light set. This parts shop sells bits and pieces to make your PC cool: light kits, case windows, glowire and special fans. The really adventurous can even light up their keyboard. This stuff looks great, and it'll help keep your PC from overheating.

Will Maher

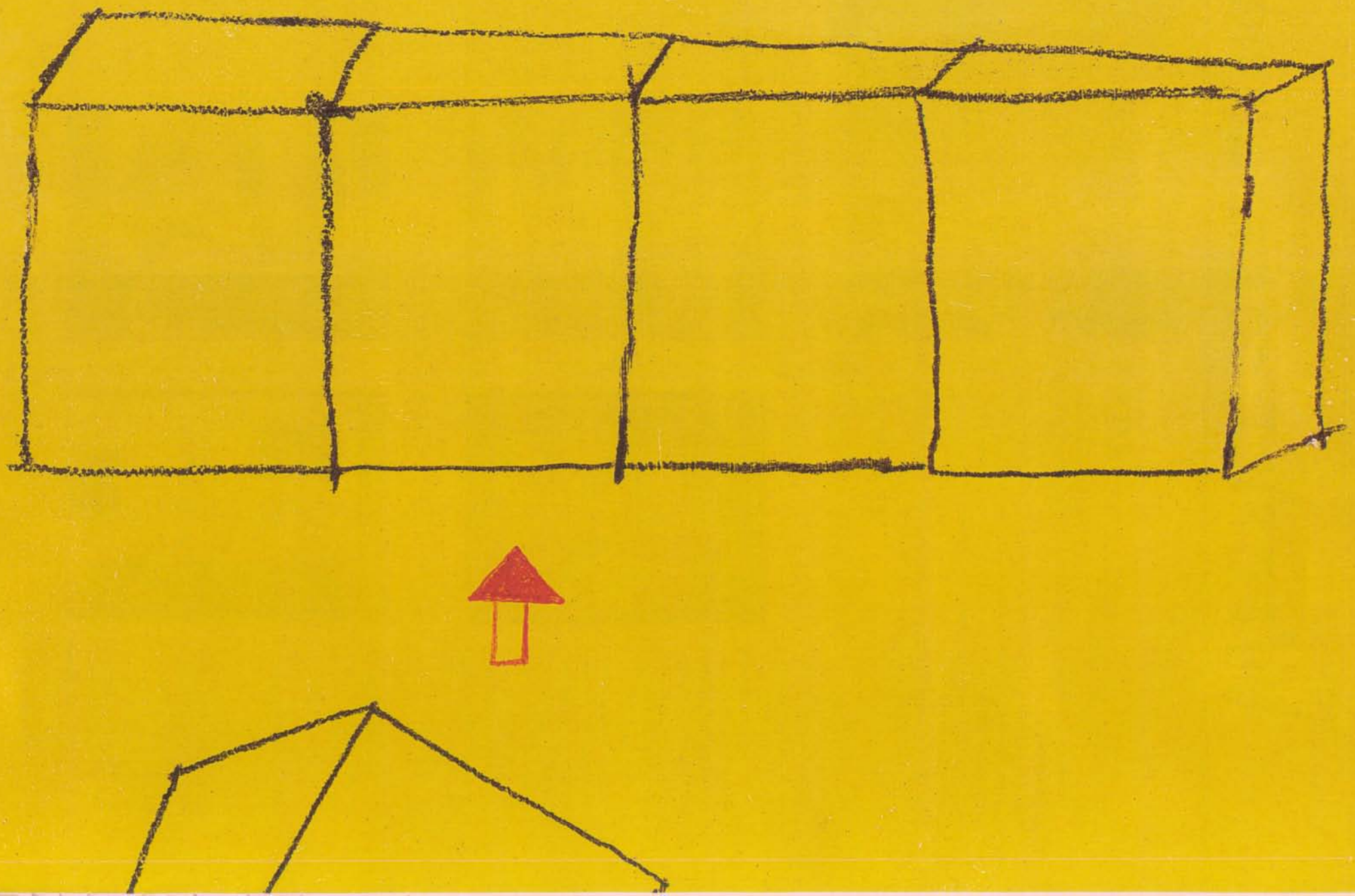
STELARC



www.stelarc.va.com.au

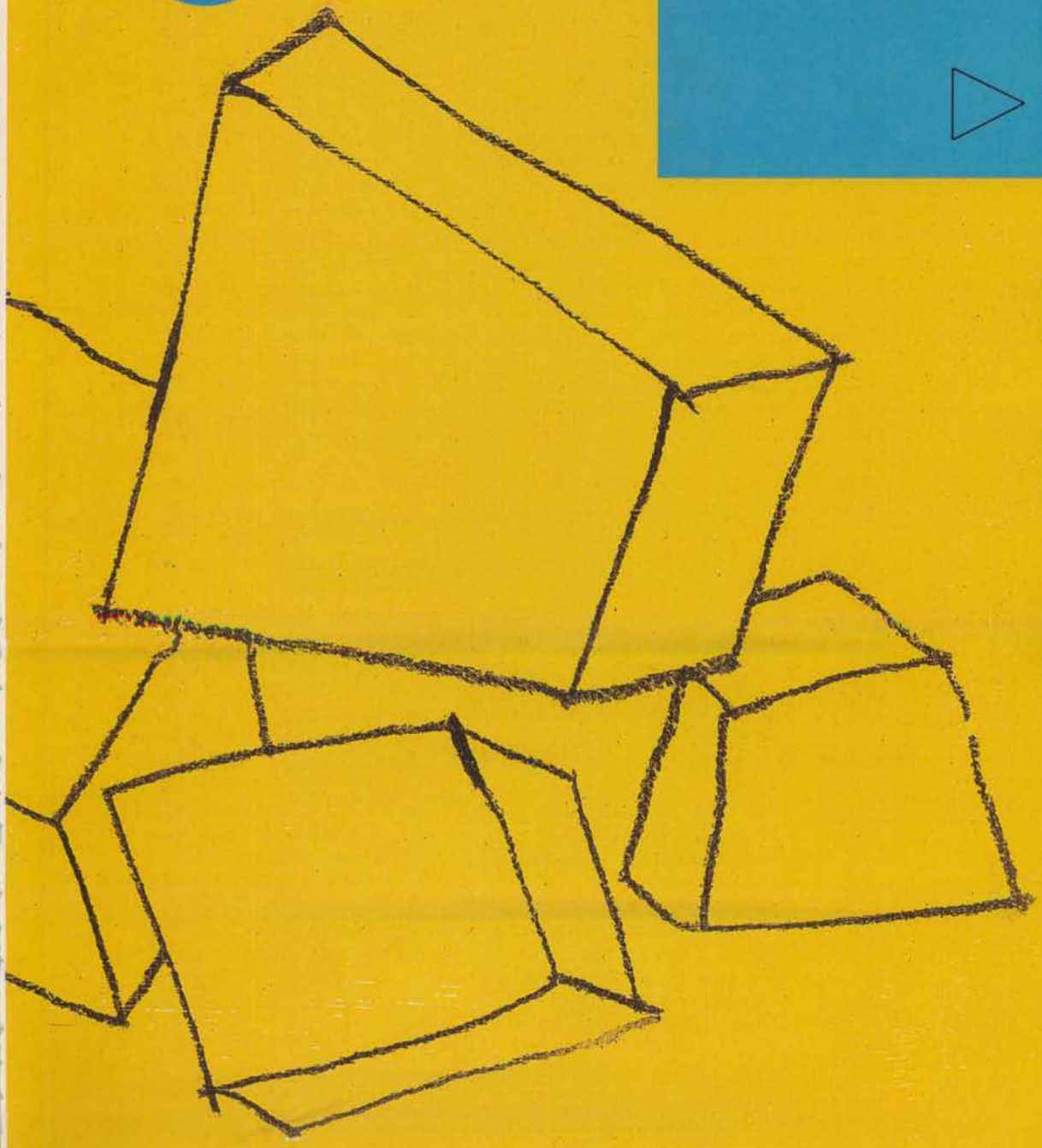
You're a cutting-edge performance artist working at the tech frontier and you're feeling a bit bored, so what do you do? You graft an extra ear onto the side of your head, that's what. Stelarc is an Australian body artist whose work includes the 'Ping Body', in which his wired-up body is controlled remotely by the audience through the Internet. The machines look great, even if the man himself is clearly as mad as an Eskimo's compass.

Jocelyn Hungerford

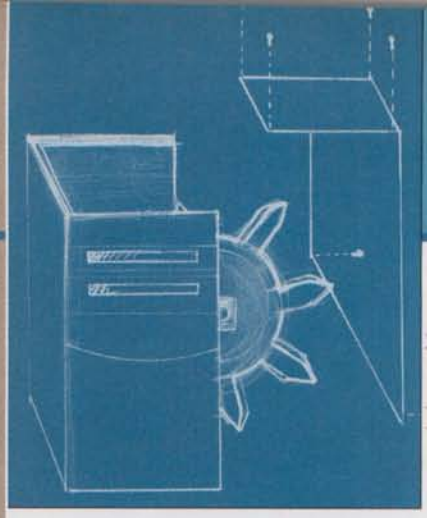


PICKING THE RIGHT CASE FOR YOUR DREAM PC MIGHT SEEM LIKE A SIDE ISSUE, BUT IT COULD HAVE A BIG EFFECT ON YOUR PC'S POTENTIAL. WE GET UP CLOSE AND PERSONAL WITH TWO REPRESENTATIVES MAKING THEIR CASES HEARD.

CASE STUDY



BY SIMON TSANG



HARDWARE

LOOKING FOR A NEW HOME FOR YOUR PC? WE WADE THROUGH THE MUDDLE AND POINT OUT THE PROS AND CONS.

Think of your favourite sports car. C'mon, I know you have one. What images does it conjure up in your mind? What emotions does it stir within you? Perhaps it's the quad-turbo, quad-cam, super-duper V20 engine that produces two million zigawatts of power, bolted right where the rear seats should have been, but it doesn't matter because it makes you weak at the knees. Of course, all that power would be little good if the car's chassis wasn't up to the task, and it wouldn't hurt if the body design left you salivating on the showroom window.

My purpose for this thinly veiled illustration is to introduce my point about choosing the right case for your PC. If you're about to build your own PC, you've probably already chosen your processor, motherboard, graphics card, soundcard, hard disk drive, and so on. But how much thought have you given to the case? It might not be as important as designing the right chassis for a high performance vehicle, but the case is like the chassis of the PC, and can affect its overall operation.

For starters, clock speeds rising into stratospheric regions for processor, memory, system bus and graphics card, although great for 3D gaming, all take their toll on the system's ability to keep its cool. Most PCs today are equipped with a minimum of four cooling fans — one in the power supply, a second in the front or back of the case, another on the CPU's heat sink and one on the graphics card. A properly designed case needs to allow sufficient airflow around the major heat-generating components, including the hard drive.

In fact, cooling is such a major consideration in PCs today that entire communities and cultures have developed around modifying aftermarket cases. Known as case-mods, these customised cases usually have extra fans and ventilation around the box to allow overclocking of the processor, graphics and RAM without it melting into a slag heap. More elaborate setups involve water-cooling and refrigeration units. Done properly, they often also include such details as round IDE cables for the drives (in place of the ribbon variety), since these have less effect on the airflow within the case. Finishing touches such as neon lights, see-through windows, paint and decals are then added purely for show. Kind of like the geek's version of hot-rodding.

Whether you intend to get into case-modding or not, it helps to start off with a sound design and good build quality. Having a rigid chassis, for example, goes a long way to making sure that minimal damage is inflicted on your system when it gets moved around. As the motherboard is mounted directly onto the bottom or side plate (depending on the case design), flexing in the case puts stress on the motherboard, which can develop hairline fractures causing intermittent faults or complete failure. Case flexing also causes riser cards to pop out of their slots — a common cause of DOA systems.

The two cases covered by the following reviews are at very different price-points, yet both exhibit thoughtful design, quality build and attention to detail. Both are rigid platforms and good starting points for putting together a system. Even if neither fits the bill for your specific needs, looking at these two in detail may help you narrow down what you're looking for. If you're passionate about building PCs, turn the TV off, take the phone off the hook, and, most importantly, shut down your PC and enjoy the next few pages uninterrupted. But beware, you may never look at cases the same way again.

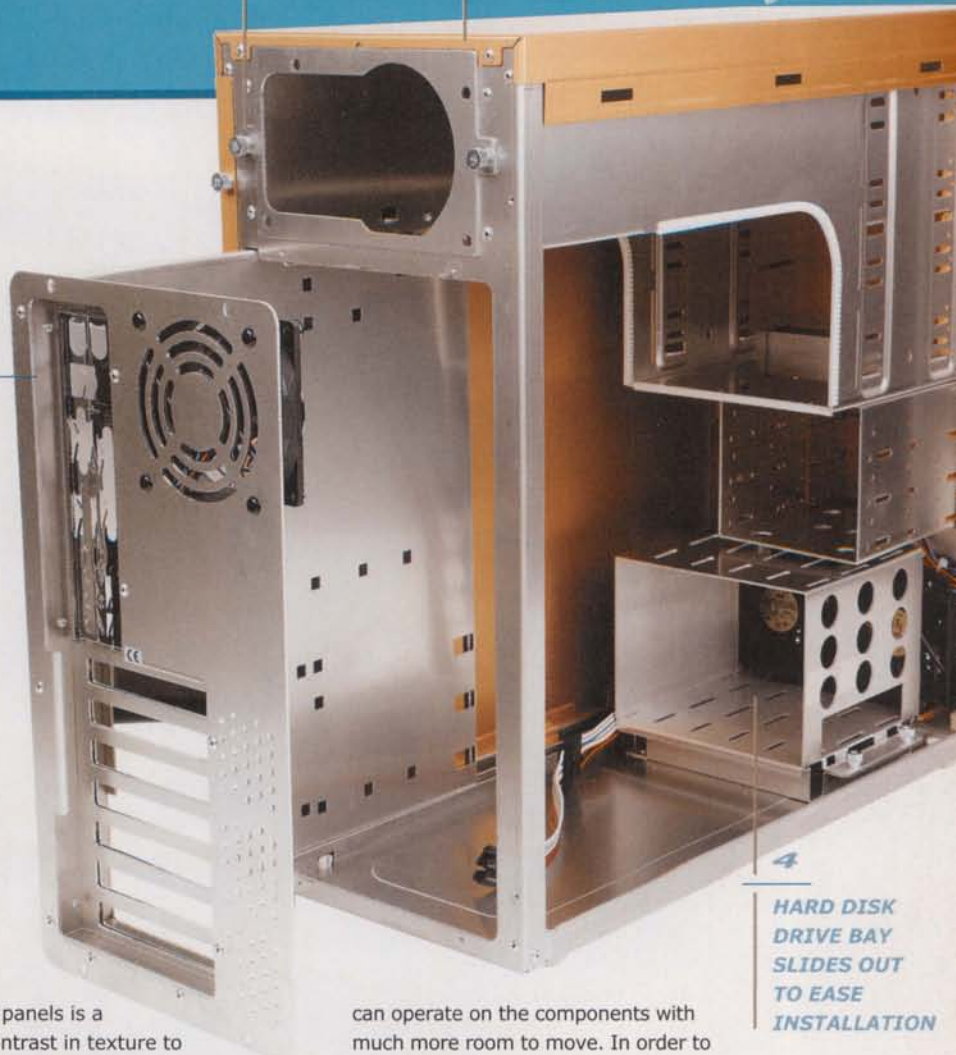
If you're not quite in the market for a brand new case, or you are happy with the box that you're currently using, you might want to check out the following sites for some ideas on how you can rev up your box.

www.casejunkiez.com/articles/neons/neons.shtml
A comprehensive site that covers just about everything you would want to know about case-modding. This page on neon lighting shows just how much detail the authors get into. Geeks.

web.singnet.com.sg/~artvale
FAQ page on how to install blowholes for your case.

www.hardocp.com/articles/casemod101/intro
Case-modding 101 introduction. Six-part case-mod tutorial.

***SIMON TSANG** has been playing around with PC cases longer than he cares to admit. His first mod involved a very big drill and a lot of Band-Aids™. He can be contacted at stsang@apcmag.com*



2 MOUNTING PLATE FOR POWER SUPPLY ALLOWS FOR REMOVAL IN A HURRY

1 FULL ALUMINIUM CHASSIS AND PANELS

3 BACK AND MOTHERBOARD PLATE SLIDES OUT AS ONE ASSEMBLY

4 HARD DISK DRIVE BAY SLIDES OUT TO EASE INSTALLATION

LIAN LI GOLD PC-66

It's the first time I've felt in danger of being mugged for carrying a PC case home on the train. Lian Li cases are legendary among PC enthusiasts and case-modders, and are generally considered to be the Rolls Royce of aftermarket PC cases. Not only because they are comparatively expensive, but because their features and attention to detail warrant that price. The full aluminium-alloy body doesn't just look cool — it is significantly lighter than a standard metal chassis of the same size, although it must account for most of the expense. The manufacturer pitches it as designed for the 'high performance PC system' with emphasis on its good airflow.

The gold model reviewed here is basically a new colour scheme for the popular PC-60 mid-tower range, which includes other 'hard anodize' colours such as black, light green and light blue, although not all colours are available in Australia. The golden PC-66 is offered in two variations — with or without USB ports at the front. The USB-equipped model features four ports at the base of the front panel and adds an extra $20 to the non-USB sample reviewed here. Bear in mind that you need the appropriate USB connection pins on your motherboard to take advantage of this.

Lian Li cases are generally not sold with a power supply included, yet the PC-66 still ships with three cooling fans as standard. Two of these are up front, lined side-by-side, their positions given away by the ventilation holes in the front panel. The third fan resides just under where the power supply would sit and is shielded by a metal guard on the inside.

The brushed aluminium finish of the exterior panels is a slight contrast in texture to the polished surfaces of the chassis it conceals, and the combination works well if you're into showing off the interior of your PC.

Four 5.25in and three 3.5in externally accessible bays are provided, which is ample for most standard configurations. However, true to its marketing message, performance freaks are catered for with an extra bay that can theoretically accommodate another five 3.5in drives internally. This is only 'theoretically' because, although its location directly behind the two front-mounted fans makes it ideal for keeping hard disks cool, fitting too many will obstruct the airflow. The bay can easily slide out after two thumbscrews are removed. Unlike the Auriga case (reviewed page 146), this case does not have a screwdriver-less design in the drive bays, which rely on regular bolts for fastening the drives.

Even though the PC-66's design makes the motherboard easily accessible once the side panel is out of the way, the entire back and motherboard panel assembly slides out as one unit, so you can operate on the components with much more room to move. In order to avoid having to unplug all the fiddly head connectors for the LEDs and switches to your motherboard when you do this, a connector switch assembly lets you keep your plugs where they should be, and just disconnect it at a single point halfway up the cable cluster — brilliant.

Removing the front panel reveals an air filter, clipped on in front of the twin fans, which can be removed for cleaning. There's also a fan-speed selector switch hiding behind the face that allows you to choose one of three speed settings, presumably depending on just how over-clocked your system is. At nearly $400, the PC-66 isn't for everyone — then again, neither is the rich gold finish with faux wood appliqué. If you like everything else about the case, but are put off by the colour, there's always the silver version. Even at this price, the Lian Li's a tough act to follow.

Contact *Anyware Computer Accessories*
Phone *(02) 9879 5788, (03) 9763 8200*
Online *www.anyware.com.au*
Price *$390 (without power supply)*
Rating ▮▮▮▮

1 THIRD COOLING FAN FITTED

2 THUMBSCREWS FOR HOLDING DOWN RISER CARDS

3 DETACHABLE HEAD CONNECTORS PROVIDED SO YOU WON'T HAVE TO UNPLUG IT FROM THE MOTHERBOARD

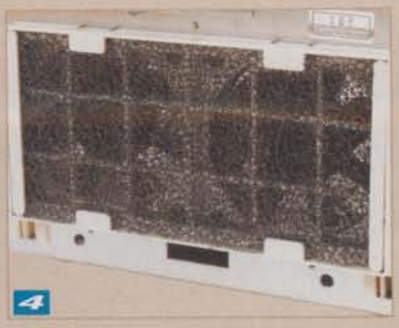
4 AIR FILTER AND TWIN FRONT COOLING FANS PROVIDE PLENTY OF AIRFLOW WITHIN THE CASE

5 THREE SELECTABLE FAN SPEEDS

6 SHARP EDGES PADDED FOR YOUR PROTECTION

1

3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5

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Cat.11808-1 Audio/Video RF Link **$299**

Keyboard with integrated Touchpad

A handy compact sized 88 key keyboard with an integral touch pad pointing device.

Cat. 8751-1 Keyboard with Touchpad **$159**

Slim-line "Numpad"

Plugs into a standard USB port. Ideal for notebooks etc. Only suitable for use under Win98/ME/2000.

Cat. 8780-1 Slim-line "Numpad" **$121**

Ethernet TCP/IP Terminal

A color, ethernet TCP/IP terminal designed for use in UNIX networking environments. It provides support for SCO UNIX/XENIX, IBM RS/6000 AIX, Sun Solaris, Interactive UNIX, SVR4,...etc. A large range of ASCII terminal emulations are provided, including WY-60, WY-120, WY-50+, ADDS A2, plus many more. This is a flexible, direct replacement for existing terminals as well as for new installations. It connects via a 10BaseT Ethernet connection. Serial connection model also available.

Cat. 1134-1 Ethernet TCP/IP Terminal **$579**

Mini-Keyboard

When desk space is at a premium an 80 key keyboard with full 101 key functionality will come in handy. This keyboard is very compact: 297mm(W) x 152mm(L) x 30(D) mm. A keyboard with a nice "touch".

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Cat. 3429-1 Surveillance Card 4 Camera Input **$1280**

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Cat. 2618-1 Printer Card Single Port PnP PCI **$69**
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An extremely compact Windows based terminal which will also emulate most Unix based terminals. Virtually nil maintenance required by this Thin-Client terminal. It is also available with Internet Explorer in ROM.

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AURIGA VF2001GH

It is unassuming in its natural form, but the Auriga's understated design conceals features that make it great value for money. A 300W power supply unit (PSU) supports plenty of devices within the shell. There are also four 5.25in bays, which makes the most of its relatively short mid-tower chassis. Two of its three 3.5in bays are externally accessible; the extra one is provided for internal drives.

Notably, this case adopts a screwdriver-less design by employing thumb screws to secure the side access panel and quick-release mechanisms to hold the drives in place. Once the drive is correctly positioned in the bay, you simply slide the green plastic bracket forward to lock it in. It is gripped firmly in place on the opposite side by leaf springs. This makes it very easy to change drives quickly. Only the top 3.5in bay has this quick-release, however; the bottom two rely on conventional screws. It works well, and is firm enough to keep the drives from moving, although not as solid as fixed screws. But this is little compromise for the added convenience.

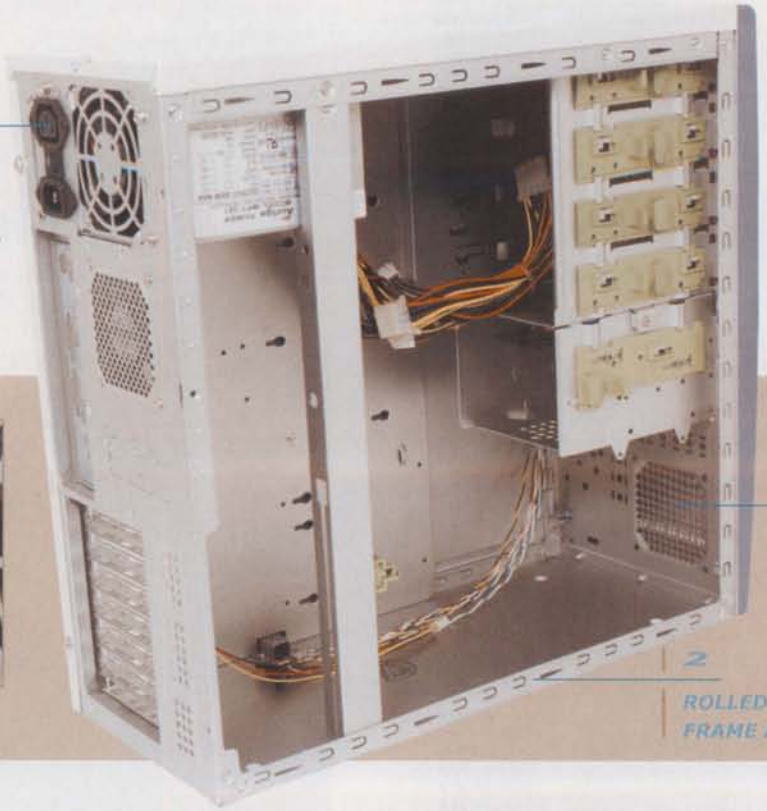
Two cooling fans are fitted as standard — one in the PSU and another one just below it — although there's room to accommodate a third at the front, just below the 3.5in drive bays. More ventilation grilles in the PSU design would have made better use of the available fan power. As it is, the small openings at the front of the power supply do little for the airflow around the CPU. The second fan appears to do all the work for cooling the system. You can power a monitor directly off the pass-through connector of the power supply, which can come in handy if you're short of mains power points.

The extra brace bar on its side not only reduces flex in the case, but also has a track for extendable plastic clips that can hold down the riser cards so that they don't pop out during transport. This is a very thoughtful inclusion and two of these clips are supplied in the kit. The motherboard mounting plate uses only two screw-down points, relying on metal clips that pop into the board itself. This then allows you to slide the board into a locked position.

The front panel's plain styling is improved (albeit only marginally) by two metallic blue accents running down each side. A little boring, but inoffensive. It can be removed by simply tugging at its base, and there aren't any physical wire connections tying the panel's switches and LEDs to the case, making it easier to pop it off for the occasional clean, or in order to mount an extra fan at the front. In action, the case is mostly quiet, though vibrations from accessing a rather noisy SCSI hard drive seemed to reverberate throughout the frame and caused it to rattle a little.

Security is also catered for, with metal lock-down clips on both sides of the case to prevent intrusion. Plastic ties are supplied to tie down the inevitable mess of cables, and are supplemented by lugs in the metal frame, which they can be anchored to. Plastic adhesive lugs are also provided. The Auriga case has a lot of well-thought-out features without the price premium. Considering that the power supply alone probably makes up more than half its cost, the VF2001GH is great value. Definitely worth a look if you're in the market for an entry-level mid-tower case.

Contact *AKA Technology*
Phone *1300 655 911*
Online *www.akatech.com.au*
Price *$130*
Rating ▮▮▮▮



1 PASS-THROUGH POWER CONNECTOR FOR MONITOR

1

2 ROLLED EDGES ON METAL FRAME ARE SKIN-FRIENDLY

3 MOUNTING HOLES AND VENTILATION GRILLE ACCOMMODATES THIRD FAN UP FRONT

3

1

300W POWER SUPPLY UNIT HAS CONNECTORS TO SUPPORT P4 MOTHERBOARDS

5

QUICK-RELEASE MECHANISM LETS YOU REMOVE AND INSTALL DRIVES WITHOUT SCREWS

2

SECONDARY COOLING FAN PROVIDED AS STANDARD

3

PLASTIC CLIP TO HOLD DOWN RISER CARDS

4

SECURITY LOCK KEEPS INTRUDERS OUT OF YOUR BOX

1

2

3

4

5

POWER BOARDS

TWO NEW MOTHERBOARDS TO EMPOWER YOUR PC — ONE FOR THE BUDGET-MINDED P4 SHOPPER; ONE FOR THE ATHLON POWERHOUND.

ASUS P4B

The P4B motherboard from Asus is based on the new Intel i845 chipset, which supports Pentium 4 processors with SDRAM rather than RDRAM.

SDRAM is nowhere near as fast as RDRAM, but it's a lot cheaper and can be installed in a mix-and-match fashion, whereas RDRAM's dual channel requires you to use two identical (and expensive) sticks. The incentive is mainly monetary, because using SDRAM over RDRAM causes a huge performance drop.

The P4B comes with six PCI slots, a 4x AGP slot and three DIMM RAM slots. The board is a Socket478 model, but can only support P4s from 1.7GHz and lower (as they are released).

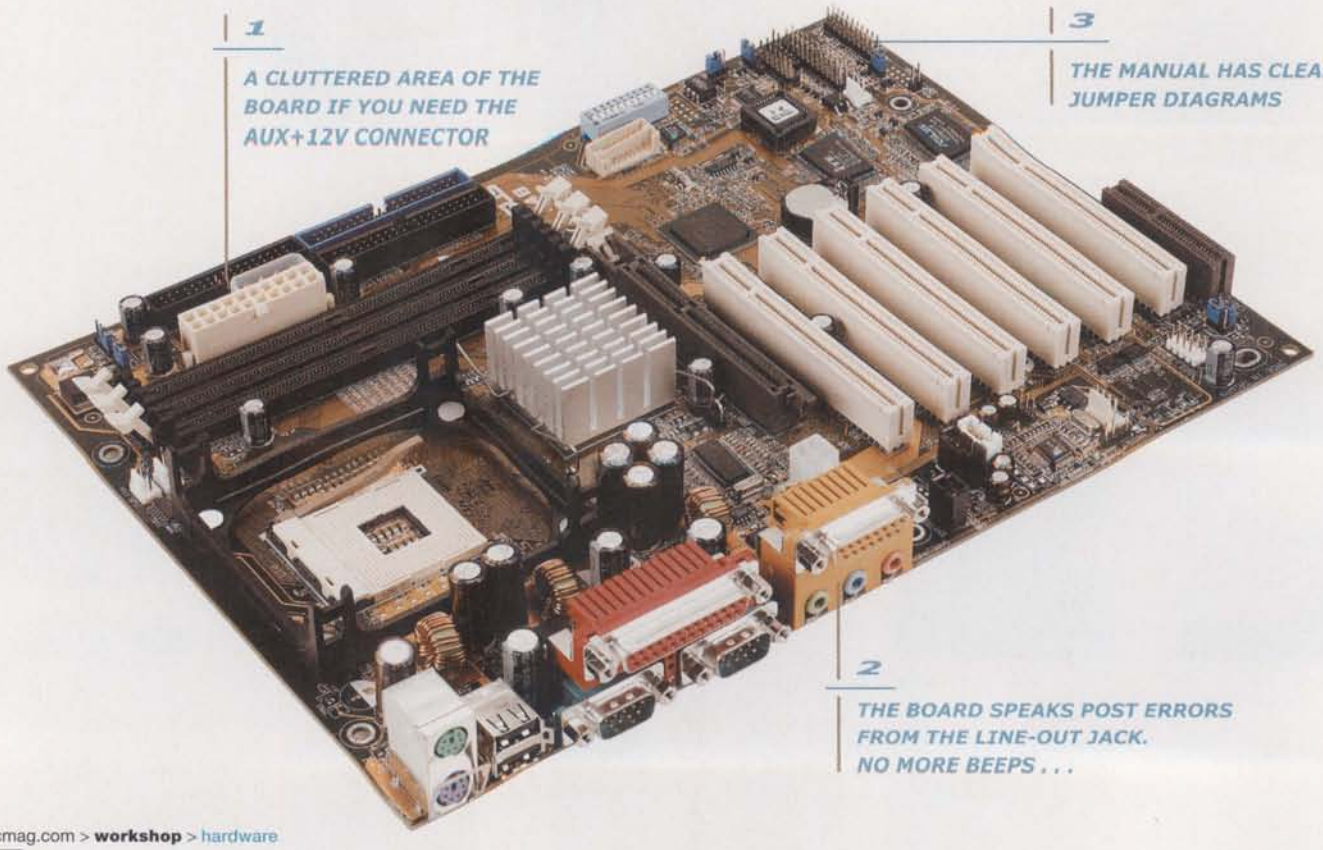
The motherboard requires a power supply with a four-pin ATX12v plug, as well as the usual ATX power connector. There are molex-to-ATX12v adaptors available, but the P4B comes with an auxiliary +12V molex socket on the motherboard, so you don't need one. The only problem is that the socket is nestled in amongst the IDE and floppy connectors, plus the ATX power socket. This is one busy area of the board, and a nightmare to connect the cables to.

We tested a buggy pre-production reference sample board from Intel last month (*APC* October, page 23), but the results were inconclusive. The commercially available P4B board worked fine with the latest chipset drivers and BIOS. The test results are on CD 1 of the CD set. The board works well, but not nearly as well as an RDRAM board or a system with an AMD Athlon chip and DDR SDRAM. Early in 2002 there will be new versions of the i845 chipset that support DDR SDRAM.

Although the techie is rarely going to encounter this, a great inclusion with the P4B is spoken-word POST (power on, self test) error messages. No more cryptic beeps to tell you the keyboard isn't plugged in; instead, a voice tells you exactly what's wrong through the system speaker or the line-out jack. Even better, the motherboard comes with a utility so you can convert your own WAV files to error messages.

There is nothing intrinsically wrong with the i845 chipset. However, you should keep in mind that purchasing a P4 with SDRAM over a P4 with RDRAM is like buying a Celeron with pared-back caches when you could buy a fully featured Pentium III. Or buying a Duron over an Athlon. If you're OK with that, and don't mind the performance hit, then the P4B is a good motherboard for you.

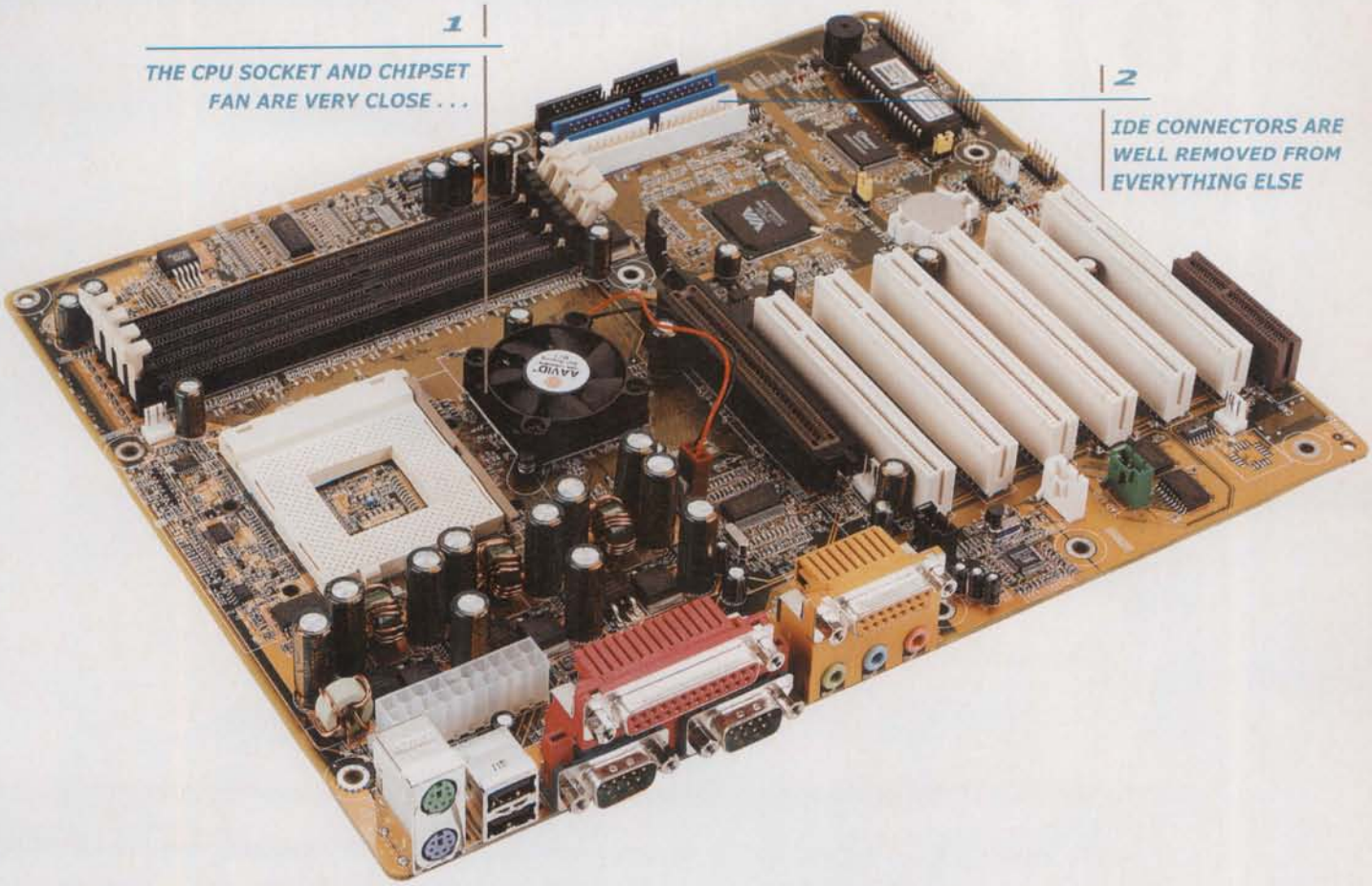
Contact *Cassa*
Phone *(07) 5445 2992*
Online *www.cassa.com.au*
Price *$389*
Rating ▮▮▮



1 A CLUTTERED AREA OF THE BOARD IF YOU NEED THE AUX+12V CONNECTOR

2 THE BOARD SPEAKS POST ERRORS FROM THE LINE-OUT JACK. NO MORE BEEPS . . .

3 THE MANUAL HAS CLEAR JUMPER DIAGRAMS



SHUTTLE SPACEWALKER AK31

The Shuttle AK31 has been around for a while, and has proven to be quite a good motherboard for the gamer or overclocker. Designed to take SocketA AMD Athlons or Durons, the AK31 shuns SDR SDRAM for the faster DDR SDRAM. There is another version of this board — the AK32 — that supports both SDR and DDR, but DDR is where the performance lies. The AK31 has four 184-pin DIMM slots that support up to 4Gb of PC1600 or *PC2100 DDR SDRAM* that runs on a 200 to 266MHz bus with up to 2.1Gb peak performance.

But that's just the RAM. Straight out of the box there's very little room to overclock the AK31, but once set to 'jumperless' mode it's time to play. The CPU multiplier goes up to a maximum of 14, so if you've got a 1.4GHz Athlon and the FSB is set to 100MHz, you're stuck with no room to overclock. But that's if you stay with a 100MHz FSB. You can increase the FSB in 1MHz increments within BIOS from 100MHZ to 166MHz — which makes for some serious power.

You can also overclock the RAM settings by adjusting the DDR voltage in BIOS. In addition, the BIOS has a live monitoring feature that allows you to check the voltage to the CPU and motherboard, as well as temperature readouts for the processor and RPM of the CPU fan. This is a handy inclusion for monitoring changes when you're slowly overclocking the CPU or RAM.

The AK31 is also a well-designed and uncluttered board. The IDE connectors are distanced from the RAM slots, the CPU is nowhere near the AGP port or RAM slots and the ATX power connector lies just behind the mouse and keyboard connectors. The only trouble you may have with the board is that the chipset fan is awfully close to the CPU socket. This means that if you've got a large heat sink it may touch or sit on the edge of the chipset fan — which was the case with the heat sink *APC* Labs used.

There are six PCI slots on the board, a 4x AGP slot and a CNR slot for riser boards. The AGP slot has a clip to hold the leading edge down firmly, and stops the card from moving when being transported or the video cable being plugged in too hard. The board also has support for six USB ports — two on the back of the board and an optional riser card that plugs directly into the motherboard with another four slots.

We benchmarked the motherboard with a 1.4GHz AMD Athlon, 128Mb of PC2100 DDR SDRAM and a 20Gb IBM hard drive. The results of the tests are on CD 1 of the CD set and give an indication of the performance you can expect from this board. It wasn't overclocked at all, and ran at the normal settings.

Contact *Sato Technology*
Phone *(03) 9899 6333*
Online *www.satotech.com.au*
Price *$210*
Rating ▮▮▮▮

DARREN ELLIS *is an avid techhead who has been writing about technology for five years, the past three with* APC. *He can be contacted at dellis@apcmag.com*

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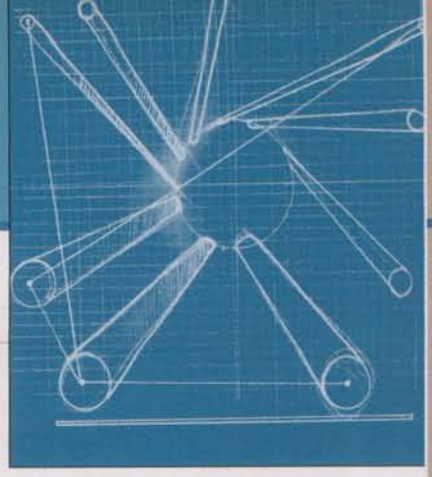
WITH DAVID EMBERTON



SHARE AND SHARE ALIKE

YOU DON'T WANT VISITORS TO YOUR SITE TO HAVE TO WAIT ANY LONGER THAN NECESSARY, SO WHY NOT GIVE THEM A HAND BY DESIGNING YOUR SITE SO THEY ONLY HAVE TO DOWNLOAD SYMBOLS ONCE?

There's an old saying that 'a problem shared is a problem halved'. I have a penchant for bastardising old sayings, so my message this month is 'a symbol shared is a download halved'. And here's why.

Flash is hard-wired for optimisation. Graphics, animation, sounds and even fonts can be created as symbols, so they can be stored once in an SWF and reused multiple times — which is great if you have just one movie, but what if you have several that include the same elements? Those symbols are being downloaded over and over again, and those extra bytes can really add up.

The solution is Shared Libraries, a feature of Flash 5 that solves the problem of repeated symbols. Any time you have something you want to reuse, just pop it in a Shared Library. When the movie is published on the Web, viewers download the shared symbols once, and they are cached for fast access thereafter.

HOW TO MAKE IT

Here in the Flash Workshop we like to share our secrets, so I've created a working example of this technique. You can find it on the *APC* Web site, as well as on CD 1 of this month's CD set.

First, take a look at figure 1, which demonstrates how the process works.

In the diagram, shared.swf contains three linked symbols. Their identifiers are Background, Logo and Shared Arial. A second movie named About.swf contains references to the shared symbols and knows where to look for them. The Linkage properties of its symbols are set to 'import from URL', the URL being shared.swf. So when About.swf is played, the shared library is loaded up and the assets are displayed.

What's particularly interesting about this example is that it uses not only Movie Clip symbols but also a font. The font outlines that allow Flash

FEATURED SITE:
www.janet-jackson.com

Janet Jackson's latest Web site is quite a piece of work. The site, which was put together by design studio Second Story, includes a 'Song Experience' which highlights several songs from Jackson's new album.

Since the Song Experience is laden with audio tracks, it is broken up into several SWF movies to stagger loading.

The various Song Experience sections all share interface elements and other symbols, so Second Story employed Shared Libraries to factor out any repetition.

The result is a (relatively) slim Flash site that looks good — and sounds good to boot.

Janet Jackson's Web site uses Shared Libraries to cut down on loading time, resulting in a great site that's not too bulky.

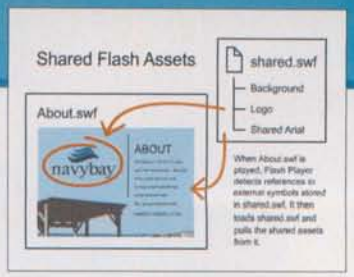


Figure 1: The file shared.swf shares its linked symbols with About.swf.

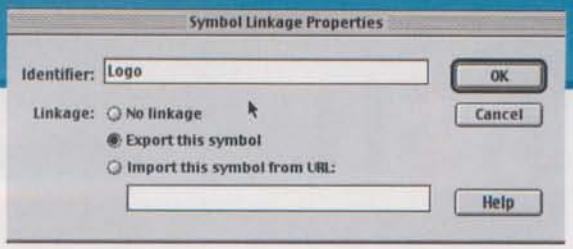


Figure 2: In the Symbol Linkage Properties box, give each symbol a unique text identifier.

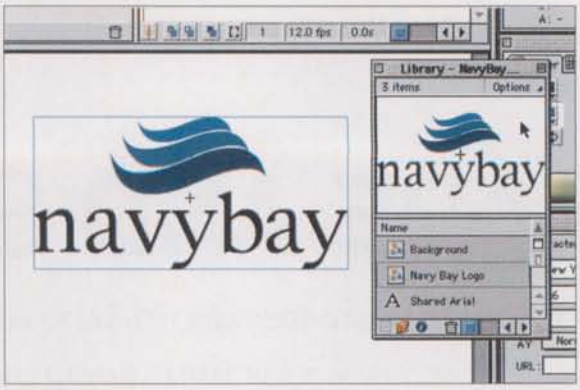


Figure 3: When you drag and drop the linked symbols into another movie, the linkage properties are automatically set.

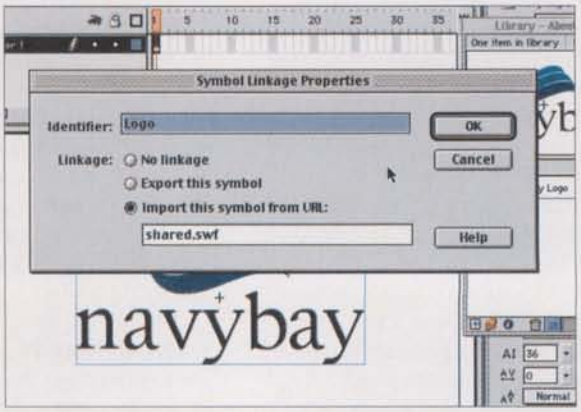


Figure 4: You can verify the linkage properties of symbols.

SHARED ASSETS

SOUND FAMILIAR?

The principle of 'download it once, then grab it from the cache' is the same one used in regular HTML pages, where JPEG and GIF images are routinely shared across an entire site. So, the Shared Library feature makes publishing Flash content a little more like creating regular HTML pages. It takes some work on your part, but the bandwidth savings are definitely worth the effort.

LOOK FOR THE ASTERISKS

Whenever you create or use a Font symbol in your movie, you'll be able to find it in the typeface list provided by the Character panel. Fonts stored as a symbol are denoted by an asterisk.

PICK AND CHOOSE

If you want to use Shared Libraries, remember that you aren't limited to just one. I'd encourage you to use several, each containing a few related symbols. If you pack your libraries with too many symbols, they will download slowly and possibly fail. But if you have too many with only one symbol each, Flash Player can be confused by trying to stream so many different files at once. So moderation is best.

SHARE IT AROUND

The best part of a Shared Library is that once you've created it, you can simply post it on the Web and anyone can use it. Just publish the identifier list and URL of your library. Then you or anyone else can manually set the linkage of a symbol to import from the URL and draw on those published assets.

HOW IT WORKS

Symbols can be forced to export, whether they're used in the movie or not, and with the Linkage dialog you can give a symbol an identifier, to be used when attaching the symbol dynamically.

Creating a Shared Library is just an extension of the linkage technique, except instead of linking symbols so they can be used in their movie, they will be used by other movies.

to display smooth text can take up quite a bit of space, but with Shared Libraries you can create your font as a symbol and then use it in as many movies as you want.

To set up your own Shared Library, start by creating an FLA file (or several, there's no need to over-pack) that contains the common assets. Decide where you're going to publish the SWF file of the library and what name you're going to give it, and plug this information into the Shared Library Properties box.

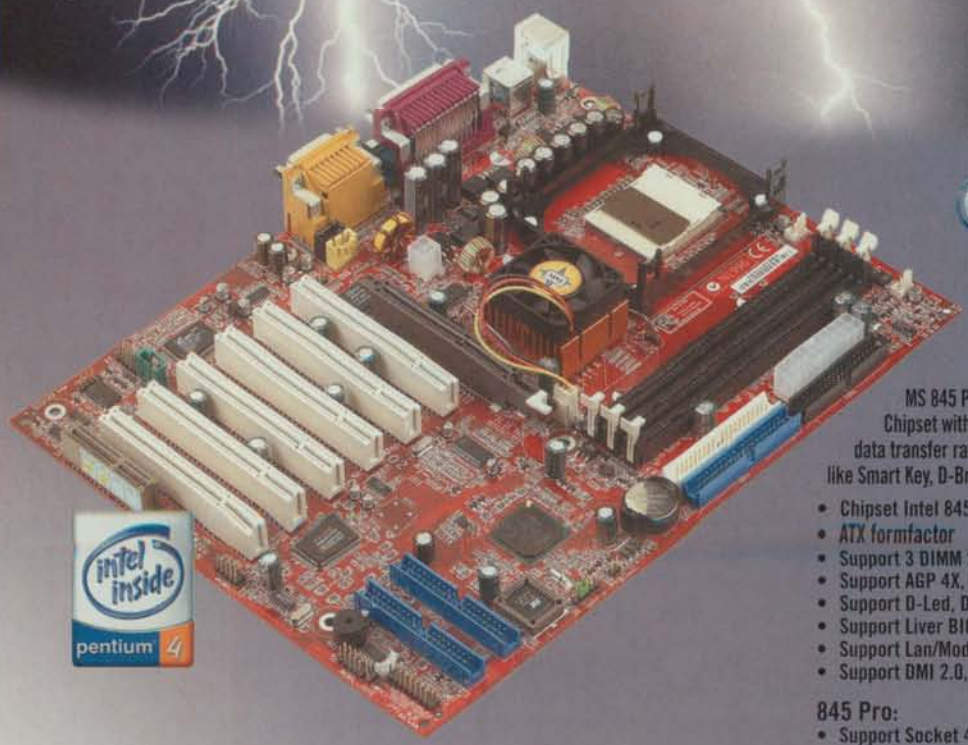
Now go through and set the Linkage Properties of each symbol, giving each one a unique text identifier (as in figure 2).

Export the FLA and close it, then reopen it using the 'Open as Shared Library' command from the File menu. Now you can drag and drop the symbols into other movies, and the linkage properties of the various instances will automatically be set, referencing the shared SWF file at the location you have specified (see figure 3).

You can also verify the linkage of each of the shared symbols. Just open the Library of your new movie, select the symbol you're interested in and open up the Linkage dialog from the drop-down menu. Notice that, in figure 4, the symbol is set to import from the URL set earlier. ■

***DAVID EMBERTON** is a freelance author and Web developer. He writes for CNET Networks, InformIT and ZDNet, and is author of the Flash Magic series. He can be contacted at david@emberton.com.*

Miracle of Digital Power.



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D Bracket

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TERRIFIC TYPE TIPS

PHOTOSHOP USERS CAN SPEND AS MUCH TIME MANIPULATING TYPE AS IMAGES. HERE'S A COLLECTION OF TIPS TO PUT YOU BACK IN CONTROL.

- **Rendering small type.** Double-click on an existing type layer to enter type-edit mode. To cause the anti-aliasing to re-render, move the type in the image window by holding down Ctrl. Once you are pleased with the anti-aliasing, accept the type changes by pressing Ctrl+Enter. You can reposition the type as desired without affecting the anti-aliasing. Adjusting the anti-aliasing can be done as often as you like by entering edit mode and moving the type. Once out of edit mode, you can move the type without affecting the anti-aliasing.
- **Dealing with text changes.** Use the Enter key on the numeric keypad, or Ctrl+Enter on the main keyboard to commit text changes. Press Esc to cancel and discard the changes. You can also use the Commit Changes button in the Options palette (Window, Show Options) to accept any type changes. Use the Cancel Changes button there to discard changes.
- **Hide a text selection.** While in type/edit mode, use the View, Show Extras (Ctrl+H) command.

Forever finetuning text size? Hold Alt as you click a text box to jump to this dialog.

- **Displaying text boxes.** To display a Paragraph Text Size dialog box, hold Alt as you click or drag a text box. The dialog box displays the current text box dimensions; you can enter the desired values for width and height. Another option when creating a text box of a specific size is to watch the width and height values in the Info palette (F8 or Window, Show Info) as you draw the text box. If you continue to hold Alt down after the mouse button has been depressed (and you begin to drag), the text box will be drawn from the centre. When you release the mouse button, the Text Box Size dialog box will appear.
- **Modify the properties of several type layers simultaneously** (for example, font, colour and size). Link the desired type layers together and hold Shift while changing the type properties. This feature applies to changes performed in the Options palette, the Character palette and the Paragraph palette (Window, Show Options/Character/Paragraph).
- **Minimise anti-aliased type inconsistencies.** Anti-aliased type may be rendered inconsistently at small sizes (or low resolutions). To minimise this, turn off the Fractional Widths option in the Character palette menu.
- **Restrict the use of certain fonts to Adobe applications**. Place them in C:\Program Files\Common Files\Adobe\Fonts\.
- **Colour tip.** Although the Edit, Fill command and the Paint Bucket tool are disabled for type layers, Alt+Backspace (fill with foreground colour) and Ctrl+Backspace (fill with background colour) still work!
- **Crashes when Photoshop attempts to load**. Try deleting the adobefnt.lst file (in C:\Program Files\Common Files\Adobe\Fonts\). Deleting this file forces Photoshop to recreate its font list and might fix the problem.
- **Font name auto-complete.** Instead of searching through the font list, simply type the first few characters of the desired font into Photoshop's font (family) name field (in the Options palette) and it will be completed.
- **Display context menus with formatting options.** Using the Type tool, right-click on type layers in the image window. The right-click menu that appears in ImageReady offers many more options than the one that appears in Photoshop.
- **Convert point text to paragraph text or vice versa**. Right-click with the Type tool and choose Convert to Paragraph Text (or choose Layer, Type, Convert to Paragraph Text from the menus).
- **Display the Character and Paragraph palettes.** While in type mode, press Ctrl+T, or press the Palettes button in the Options palette.
- **For bold or italic fonts.** If there is no associated bold or italic equivalent of your font, try using the Faux Bold and Faux Italic options in the Character palette menu. You can also access the Faux Bold and Faux Italic options by right-clicking on a type layer with the Type tool. ■

***TREVOR MORRIS** is a 2D/3D graphic artist and Web developer who specialises in Photoshop and Illustrator. He can be contacted at tmorris@funds.net*

Introducing the Palm™ m500 handheld series. It lets you see the world in a refreshingly new light, with the Palm™ m505 handheld's 16-bit colour screen and the Palm™ m500 handheld's high contrast display. Gives you room for expansion with the Secure Digital/MultiMedia Card. Even helps you connect to the Internet, send and receive short messages (SMS) and manage your email easily with the Palm™ Mobile Connectivity Software. The possibilities are endless.

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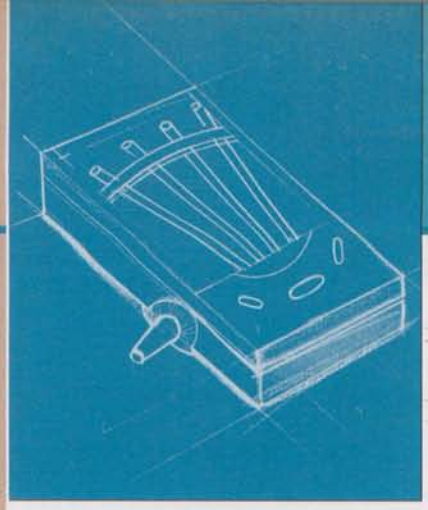


WITH DAVID FLYNN

CARD TRICKS

EARN YOUR BSC (BACHELOR OF STORAGE CARDS) WITH THIS CRASH-COURSE IN HOW TO USE MEMORY CARDS ON YOUR PALM.

Palm's decision to back the MMC/SD card format means that your next Palm is likely to include a card slot. Indeed, you might already have sprung for the m500, m505 or the new budget-minded m125 (see page 28). Here's what you need to know about Palm cards, and how to get the most from them.

TWO OF A KIND

Palm handhelds support two types of cards: SD (Secure Digital) and MMC (MultiMedia Card). They share the same postage stamp-sized footprint and wafer-thin profile, but the SD card is thicker.

Palm promotes SD as a read/write format, while describing MMC as 'read only'. This is a furphy: while Palm and other companies distribute software and content on the MMC format, locked into read-only mode, you *can* buy MultiMedia Cards and read or write onto them just as you would a floppy disk.

In fact, apart from esoteric features such as optional copyright protection of data (which means a lot to the industry, but precious little to most users) and a physical write-protect tab, there's almost no difference between MMC and SD when used as memory cards.

SD was designed for a maximum data throughput of 10Mb/s, four times that of MMC's 2.5Mb/s peak rate. This is useful for hardware add-ons such as Bluetooth cards, MP3 players and digital cameras. However, the rate for transferring files between card and Palm is much lower at about 200Kb/s, and at this speed there's little between MMC and SD. Running a backup of my Palm m505, with a half-full data tank of 4Mb, returned almost the same time for the two cards.

Why is this important? There can be a sizeable price discrepancy between MMC and SD cards. Yet the cheaper MMC format will do just as good a job as SD.

Have card, will travel

If you've splurged on one of the popular PalmPak Travel Cards, you'll be aghast to discover that these 16Mb MultiMedia Cards contain no more than 4Mb of files. Wasteful! And being read-only, there's no way to put that extra space to use. But you can always buy your own 16Mb wafer and use a USB card adaptor to copy the files onto the new card via the PC. You can also add other useful travel apps such as restaurant guides and subway maps, as well as some ebooks and games to while away the time in transit.

They look the same, and for most purposes they work in the same way, but MMC cards can be much cheaper than their SD counterparts.

Flashmemory.com.au lists 16Mb MMC and SD cards both at $71, so you may as well get SD so you can protect your card-based data from accidental erasure. However, 32Mb MMC wafers cost $107, compared to $142 for an equivalent SD card; and 64Mb MMCs come in at $166, against $202 for an SD card.

This is certain to change in the future: SD pricing will fall to the point where it edges out MMC, at least on the consumer market, although some third-party vendors may choose to stick with MMC for distributing card-based programs. For now, you can get more memory for your money buying MMC.

SHUFFLING APPS

As soon as you drop an MMC or SD card containing programs into a Palm, the main menu screen displays a new category listing the apps on the card. Tapping an icon automatically launches a process which first copies the applet and its data into the Palm's memory, and then runs the program.

That's because, cards don't extend your Palm's working memory — the block of RAM which is shared between storing and running programs. Cards only give you room for storing more data, in the same way that a hard drive stores programs on your PC. Programs still need to be copied into RAM to run.

The irony is that you have to keep enough Palm memory free to store the program when it's copied from the card — and one of the main reasons for buying a card is that your Palm is forever running out of room. This copy-before-execute process also seriously slows the process of running applets from the card.

Only data files such as documents, images and databases can be read directly from the card without swapping them into memory. Cards are thus ideal for storing data like ebooks and photos. However, not all Palm programs have been updated to be 'card-aware' — to detect or open files stored on the card. Many can only read data residing in the Palm's onboard memory.

Out of the box, your Palm doesn't come with any means of managing files; the CardInfo applet in Palm OS 4.0 is limited to formatting and naming cards.

Luckily, the Palm programming community has been quick to conjure up several programs which defeat these shortcomings and let you make the most of MMC and SD cards. We've bundled several onto this month's CD set — McFile, Filez, PowerRun and MSMount.

STACKING THE DECK

An essential companion to any MMC or SD card is a file manager. Mirroring their desktop PC equivalents, Palm file managers let you create folders; copy, move and delete card and memory-resident files; and carry out Palm-specific operations such as beaming.

McFile and Filez are freeware file managers that sport an easy-to-use Windows-like interface. McFile is notable for being a Japanese creation; like several card utilities, it was written to work with the Memory Stick built into Sony's Palm-based Clio handheld, which is hugely popular in the home market. When you're installing any of these programs, make sure you run the English-language program!

Some users might find PowerRun worth a look. It moves apps and their data from system memory onto a card, where they can be run like any other card-based program. This works well for shifting memory hogs out of the RAM block until they're really needed.

If your favourite applets haven't been updated to recognise documents stored on a card, MSMount is the answer. MSMount (the MS stands for Memory Stick) adds an item to the Palm's Preferences menu where you can specify a card directory that is accessible to Palm applets. You'll need to create the folder using a file manager, and then load it with the various ebooks, pictures and other databases to be read by applets sitting in the Palm's system memory. By 'mounting' the directory, its contents are included within the scope of all Palm applets, so you can open them as if they were on the Palm itself.

Investing in a modest 16Mb card and spending some time experimenting with these utilities will take your Palm power to the next level. Just be warned that application support for cards remains patchy in these early days.

SD/MMC drives plug into your PC's USB port and make working with Palm cards much easier.

DEALING THE CARDS

Formatting a card with CardInfo creates a /palm directory, which contains a /launcher directory. Items stored in /launcher appear automatically on the Palm's main menu screen when the card is inserted. If you're running MSMount, you can create a separate directory for your card-based documents and data, leaving /launcher free for applications.

Another superb piece of kit for rolling your own cards is a card reader/writer that plugs into your desktop or notebook PC. Zio's SD/MMC USB drive ($104 from Connectix, **www.conexus.com.au**) works like a charm. It plugs into the USB port of your Windows PC, where Windows treats it like any removable drive. Pop in an MMC or SD card and you can create folders and copy Palm files from your PC onto the card — it's ideal for being able to quickly and easily load applets onto your Palm without having to go through the usual HotSync routine. ■

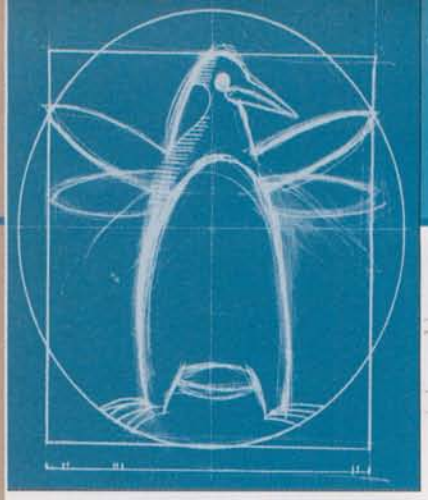
Missing megabytes

How much data can you fit onto a 16Mb SD card? 16Mb, you say? Bzzzt — wrong. The magic number is 15.25Mb.

Memory cards, like most storage media, shortchange users. It comes back to definitions. One megabyte is officially understood as 1,048,576 bytes — 1,024 (the number of bytes in a kilobyte) times 1,024 (the number of kilobytes in a megabyte). This is how Palm OS, Windows and other operating systems measure a Mb.

Card manufacturers employ the looser definition of 1Mb being a million bytes, in the same way that 1 megalitre is a million litres. So a card touted as 16Mb is pegged at 16,000,000 bytes of data. Divide that number by 1,024 (the number of bytes in a Kb) and you'll realise it holds only 15,625Kb. Divide by 1,024 again (the number of Kb in a Mb) and you'll discover the true capacity is 15.25Mb.

***DAVID FLYNN** bought his first handheld, an original Pilot 1000, in 1996. He's since owned several devices for the Palm and Pocket PC platforms and is one of Australia's most handheld-savvy journalists.*



WELCOME TO THE SOURCE

CVS LETS HUNDREDS OF DEVELOPERS WORK ON THE SAME SOURCE CODE, BUT YOU CAN USE IT TO DOWNLOAD THE LATEST CODE BEFORE ITS RELEASE.

I'm sure you're familiar with the philosophy behind open source software — developers from around the world, sometimes hundreds of them, cooperate to work towards a single goal: developing and producing high quality software. But have you ever wondered *how* they do it? Wouldn't a single codebase edited by hundreds of geeks get quite messy? Not with CVS.

CVS (Concurrent Versions System) is like a groupware database. It stores many different versions of a program's source code in a way that allows more than one developer to work on it simultaneously. CVS keeps track of changes made to the source code tree and communicates these changes to other developers, so that ultimately everyone has the same code base. CVS is also able to 'roll back' to previous versions to help track bugs and explore new development possibilities.

There's also another side to CVS: although the source tree of a project under development cannot be changed by anyone other than the developers of the project, anyone can browse, download and compile the source in its current form. This means that if you lust after the latest versions of your favourite programs, you don't have to wait for the next official release. Instead, you can download the source code for the current developmental version and compile it yourself.

For instance, you can explore the latest versions of XMMS, GIMP, Mozilla, even the whole of Gnome and KDE. It's extremely easy to do, although compiling developmental source is not always easy, as we shall see. To demonstrate how you go about downloading and compiling developmental source code, we'll use the very latest source code for the KDE project as an example.

Want more source?

There's something to be said for running daily builds of projects like KDE: you get to preview, play around with and take advantage of new features long before their official release. You also get to encounter bugs first, which is why if you've taken the time to download and compile a project in development such as KDE via CVS, you might as well take the time to inform the development team of any bugs you find. Beta testers are always welcome, and your input will go towards making a better product.

If the potential of CVS has you excited, you probably want to know more about other projects whose source can be downloaded through CVS. Most projects should list this information on their home page, but you can also go to **www.sourceforge.net** for the definitive guide.

TOOLS OF THE TRADE

There are two popular tools for accessing CVS servers: the CVS program itself, which is included with all distributions and often installs by default; and CVSup, a faster program which is slightly easier to use and which has a graphical interface. In this example we'll focus on CVSup, which can be found at **www.polstra.com /projects/freeware/CVSup** and is included on this month's CD set. We'll also include instructions for CVS.

If you plan to follow this example, make sure you have about 500Mb of spare hard drive space (up to 200Mb is needed for the source, as is a similar amount for the compilation and installation), and that you have CVSup and/or CVS installed.

CVSUP

As is the case with many open source projects, KDE details how to access its CVS servers from its home page (**www.kde.org**). For the most part, we'll follow the instructions provided, but there will be a few differences in our approach.

First, we need to create a configuration file for CVSup to use. Start your favourite editor and create a new file in your home directory called something like kde.cvsup. Enter the following:

```
*default host=cvsup.kde.org
*default base=/usr/src/kde
*default prefix=/usr/src/kde
*default release=cvs
*default delete
*default compress
*default tag=.
*default use-rel-suffix
kde-common
kdelibs
kdebase
kdesupport
kdebindings
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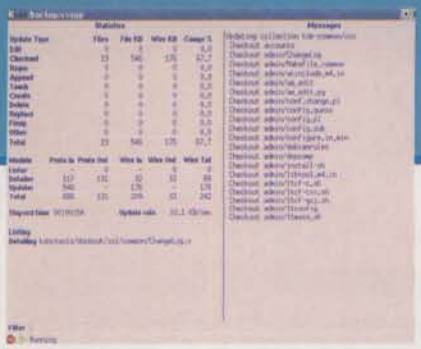

CVSUP working its magic.

The first part of this file specifies which server is connected to, where the source code is stored locally, and which CVSup options are used. The second half specifies which KDE collections are grabbed. At a bare minimum, all of 'kde-common', 'kdelibs', 'kdesupport' and 'kdebase' are required.

The other collections are those that often form a default KDE installation. Depending on how much you want to grab and compile, you can also add the following to the list:

kdegames
kdesdk
kdetoys
kdevelop
koffice
kmusic

It's important to be aware that the more collections you grab, the more likely you are to encounter work-in-progress. While some sections will compile and install just fine, other collections won't compile at all, simply because the code isn't in a state that is ready to be compiled.

When you're ready, save the file. Next, you need to create the /usr/src/kde directory, if it doesn't already exist. Then, run CVSup as follows:

/usr/local/bin/cvsup ~/kde.cvsup

If nothing seems to happen, kill the process and run the same command with the '-g' switch. This tells CVSup to run without the GUI, and allows you to see error messages. There are a number of reasons why CVSup may fail to start: the local directory might not exist (if so, you need to create it); it might not be able to find the CVS server; or the server might be full and disallowing access. The server at **cvsup.kde.org** can sometimes be rather busy, so if this does occur, try using one of the mirrors listed at **www.kde.org/cvsupmirrors.html**.

The first time you run this command you need to leave your machine running for an hour or two while it downloads your selected source code. When you subsequently run the command, however, you can obtain the very latest source in a matter of minutes.

This is because CVS is a version control system, so only the *changes* in the source tree compared to the version you currently have are sent down the line. This makes updating the source tree quite fast, even for a huge project like KDE.

CVS

CVS isn't as nice to look at as CVSup, and it's not quite as easy to use, but it is the de facto standard for CVS, and you'll find that many more projects support CVS than CVSup. If for some reason you are having trouble getting the source using CVSup, try CVS as follows.

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KDE, like a desktop should be!

Following the instructions from the KDE Web site again, create a file in your home directory called .cvsrc and add:

```
cvs -z4 -q
diff -u3 -p
update -dP
checkout -P
```

The '-z' option specifies compression, so the higher the value, the more the code will be compressed before sending, which means quicker transfer times. However, it also means that the server's CPU has to do more work, which can have a detrimental effect on other users. It's generally considered polite to use a value no higher than '3' on all CVS servers.

Next, from a terminal, run:

```
export CVSROOT=:pserver:anonymous
@anoncvs.kde.org:/home/kde
cvs login
```

If prompted for a password, just press Enter. Similarly, if there is a question about a password, press Enter. As with CVSup, use a mirror if the main KDE CVS site is too hard to access.

To start grabbing the source, use:

```
cvs co kde-common kdelibs kdebase
kdesupport
```

Again, these are the minimum required collections, so you need to add any others that you want (see the list above). The 'co' command tells CVS to 'check out' these collections. You only need to issue this command the first time you download the source. In future, you need to use 'up' instead of 'co' to update the source.

USE THE SOURCE, LUKE

You now have the very latest source code for KDE sitting on your hard drive. Next you just './configure' and 'make', right? Not quite. You're in developer territory now, and these are the rules: be prepared, and nothing is guaranteed to work. To be prepared, you need to make sure you have proper developer packages installed — autoconf, m4, automake, libstdc++ development, and, if you want to take advantage of tools such as SSL in Konqeror, the SSL development libraries. You most certainly need to have the latest version of Qt installed — you can get it directly from Trolltech at **www.trolltech.com** (make your life easy and grab the binaries). Qt runtime files already exist on your system (if you're running or have installed KDE), but the Qt *development* libraries are probably not.

Some of the other tools may well be installed regardless, but if not, grab them from your distribution CDs. To find out whether they're installed, use **rpm -qi [package]**. Alternatively, you should be informed of missing packages by the configure script.

Next, you need to use environment variables to specify where Qt is installed and where KDE is to be installed. It's wiser not to overwrite your current KDE installation, so install the new files in /usr/local. Create a new text file called something like 'kde2', and add the following (changing paths to match your system):

```
QTDIR=/usr/local/qt2
KDEDIR=/usr/local/kde
PATH=$KDEDIR/bin:$PATH
LD_LIBRARY_PATH=$QTDIR/lib:$KDEDIR
/lib:$LD_LIBRARY_PATH
KDE_LIBRARIES=/usr/local/kde/lib

export QTDIR KDE_LIBRARIES LD_
LIBRARY_PATH PATH KDEDIR
```

Then, make the file executable (**chmod +x**) and run it. In future, just remember to run this file before you compile. Assuming everything is in place, you can compile your selected KDE packages by changing into each collection directory (such as 'kdebase') and running:

```
ln -s ../kde-common/admin admin
make -f Makefile.cvs
./configure
make
make install
```

You only need to run the first 'ln' command if you used CVSup instead of CVS. It only needs to be run once, after you've first downloaded the KDE source.

You'll recognise the rest of the commands as standard for compiling programs. Remember, you can enable and disable some features using the configure script (such as enabling anti-aliased fonts, or disabling debug code to create faster and smaller binaries). Just run **./configure —help** to see what's configurable for each collection.

If you're lucky, these commands will pass without a hitch. If not, read the errors, roll up your sleeves, and see if you can solve the issues. If they're beyond you, there's not a lot you can do. This is cutting-edge, incomplete software, so you can't expect it to work every time.

If everything does compile, you will have fresh, up-to-date binaries of KDE in /usr/local/kde. There are two ways you can take advantage of these binaries: run them from /usr/local/kde whilst running your current version of KDE, or if you've got the whole shebang, start the new version of KDE when you log in, instead of running the current one.

To do the former, just run your 'kde2' executable environment setting file and then run the program using the full path to the binary. I'd advise against running the new version of KDE complete. Using an entirely developmental desktop is not just unwise because of stability issues; it's also frustrating. All components rely on each other, and in an incomplete program like this, they're all at different stages of development, so trying to get the whole to run in a stable way is just not fun. One day it works fine, then you update via CVS, compile, and suddenly something doesn't work anymore, or worse, it doesn't even boot. Remember, this is software in development, sometimes in pre-beta form.

That said, choice is a wonderful thing. If you do want to run a testing desktop, all you need to do is execute your environment setting file, then start KDE using **xsession** or **startkde**, and add this sequence as an extra option to your graphical login manager. If you're using gdm you'll find what you need to edit in /etc/X11/gdm/sessions. If you're using kdm, check out /etc/X11/wmsession.d. ■

***ASHTON MILLS** is a Linux specialist and editor of* The Linux PocketBook *and* The Advanced Linux PocketBook. *He can be contacted at ashtonmills@bigpond.com*

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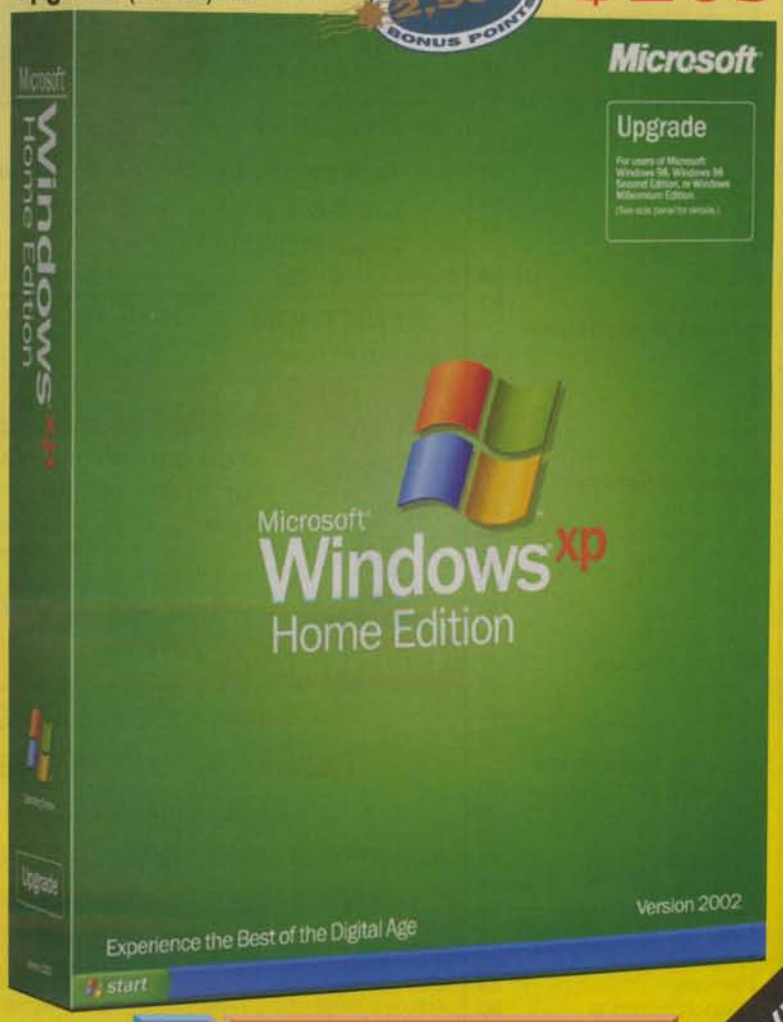

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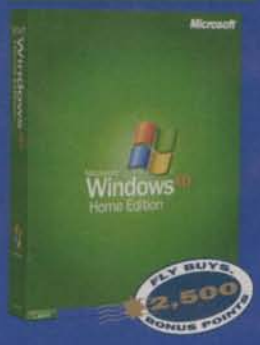

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- Windows Messenger for text, visual or audio chat.
- Ease of use for "digital memories" with My Pictures and Movie Maker.
- Windows Media Player to organise, burn and store music.
- Remote Assistance.
- Rock solid stability of W2K code base.
- Inbuilt internet firewall.
- Faster and easier peripheral intergration.

WINDOWS XP PROFESSIONAL

All features of Home PLUS

- Security with file encryption.
- A must if they wish to join a network domain / server based environment.
- Remote Desktop and application sharing.
- Wireless Networking Support.
- Additional features to secure and optimise power for laptop users.
- Remote assistance.
- Support for dual processor machines.
- Backup and Automated System Recovery (ASR).
- Dynamic disk support.
- Roaming profiles & other network enabled activities.

HOME EDITION GST INC (C9882): **$409** HOME EDITION UPGRADE (C9883): **$209** PROFESSIONAL GST INC (C9884): **$582** PROFESSIONAL UPGRADE (C9885): **$409**

start UP TO 46% FASTER THAN WINDOWS ME AND WINDOWS 98!!! 4:20 AM

Microsoft Office xp

For Microsoft Office XP pricing see our Web Direct Link above or page 63

FLY BUYS 2,500 BONUS POINTS

Collect 2,500 Bonus Fly Buys points when you purchase C9882, C9883, C9884 or C9885 between 20/10/01-30/11/01

LICENCING

Harris Technology can help you with all of your Microsoft licencing requirements. This includes all Open Business, Software Assurance and Upgrade Advantage*.

Please visit our website to browse the range and check our prices, or, for additional information, please call our sales line on 1300 13 9999.

**Upgrade Advantage will be discontinued as of February 28th 2002.*

PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

Sales: 1300 13 9999 Web: www.ht.com.au
Fax: 1300 13 6666 Email: sales@ht.com.au

See Page 2 for Locations

TOSHIBA

Prices are subject to change. Check here for latest prices & products!!

Web Direct www.ht.com.au/cat/toshiba

The ultimate statement in mobile computing

Ask About...

EXTENDED HARRIS TECHNOLOGY WARRANTY

- Extend to a total of 3 Years Return to Base
- Extend to a total of 5 Years Return to Base
- Upgrade Return to Base of Warranty Extension to On-Site

NO FURTHER DISCOUNTS AVAILABLE ON...

ALL TOSHIBA NOTEBOOKS AND ACCESSORIES SOLD FROM HARRIS TECHNOLOGY.

RENTSMART

SEE PAGE 64 FOR MORE DETAILS

The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

Satellite 1800

Satellite	1800 (Not Pictured)	1800
PROCESSOR	Celeron 900MHz	PIII 850MHz
RAM STD	128 MB	64 MB
HARD DRIVE	15 GB	15 GB
SCREEN	13.3" XGA TFT	13.3"XGA TFT
POINTING DEVICE	Touch Pad	Accupoint
CD-ROM/DVD	CD	DVD
PORT REPLICATION	No	No
VIDEO RAM	16 MB	8 MB
56K v9.0 & 10/100 LAN	56 K	56 K/Eth
WARRANTY	1 Year	1 Year
OP SYSTEM	Windows XP HE	Windows Me
PART NUMBER	(D1520)	(C5251)
GST INC	$Call	$3,099
Rent* /wk	$Call	$30.39

NEW!

The award-winning series of Satellite notebook PCs offer the ideal balance in affordability and performance. Every Satellite is built with the right mix of features to help you power through your day-to-day computing requirements. Whether for business or pleasure, the Satellite range is the perfect choice to take you into the new world.

Satellite 3000

Satellite	3000
PROCESSOR	PIII 850MHz
RAM STD	64 MB
HARD DRIVE	15 GB
SCREEN	14.1" XGA TFT
POINTING DEVICE	Accupoint
CD-ROM/DVD	DVD
PORT REPLICATION	No
VIDEO RAM	16 MB
56K v9.0 & 10/100 LAN	56 K/Eth
WARRANTY	1 Year
OP SYSTEM	Windows Me
PART NUMBER	(C5254)
GST INC	$4,095
Rent* /wk	$38.27

HARRIS TECHNOLOGY™

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TOSHIBA

Prices are subject to change. Check here for latest prices & products!!

Web Direct www.ht.com.au/cat/toshiba

Satellite Pro Power

Satellite Pro

Exceptional performance with wireless connectivity!

The Satellite Pro® series give you the best of both worlds — power and affordability. Built with just the right mix of features to let you power through day-to-day computing tasks with ease, colourful displays and powerful processors provide plenty of CPU horsepower to even the most demanding applications, while the integrated multimedia devices never leave functionality behind.

RENTSMART

SEE PAGE 64 FOR MORE DETAILS

The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

HARRIS TECHNOLOGY. for all your computer needs!

Satellite Pro	4600-750	4600 - 750	4600-850	4600-900
PROCESSOR	Cel 750MHz	PIII 750MHz	PIII 850Mhz	PIII 900MHz
RAM STD/MAX	64/512 MB	128/512 MB	128/512 MB	128/512 MB
HARD DRIVE	15 GB	15 GB	20 GB	30 GB
SCREEN	14.1" TFT	14.1" TFT	14.1" TFT	15.0" TFT
CD-ROM/DVD	DVD	DVD	DVD	DVD
VIDEO RAM	16 MB	16 MB	16 MB	16 MB
56K v9.0 & 10/100 LAN	56k/Ethernet	56k/Ethernet	56k/Ethernet	56k/Ethernet
WIRELESS LAN	Antenna Only	Antenna Only	Antenna Only	Yes
WARRANTY	1 Year	1 Year	1 Year	1 Year
WINDOWS '98	(C4238)	(C5940)	(C5924)	(C5941)
GST INC	$3,045	$3,850	$3,989	$4,925
Rent* /wk	$29.86	$35.98	$37.28	$46.02
WINDOWS NT/2000		(C6712)	(C5942)	(C6714)
GST INC		$3,995	$4,176	$5,112
Rent* /wk		$37.33	$39.02	$46.59

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Order on-line www.ht.com.au

TOSHIBA

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Tecra & Portege Models

NO FURTHER DISCOUNTS AVAILABLE ON...

ALL TOSHIBA NOTEBOOKS AND ACCESSORIES SOLD FROM HARRIS TECHNOLOGY™

Tecra 9000

The most mobility & power without compromise!

The Tecra® series is equiped for consistant mobile performance — providing you with the ultimate combination of traditional Tecra investment benefits, high processor performance and a new sleek look and feel that you will notice. Each Tecra comes with DVD drive standard.

Tecra 9000	9000-866	9000-933	9000-1066
PROCESSOR	PIII 866MHz	PIII 933MHz	PIII 1066MHz
RAM	128 MB	128 MB	256MB
HARD DRIVE	20GB	20GB	30GB
SCREEN	14.1" XGA	14.1" SXGA	14.1"TFT SXGA+
CD-ROM/DVD	DVD	DVD	CD-RW/DVD
PORT REPLICATOR	Optional	Optional	Optional
VIDEO RAM	16MB Int	16MB Int	16MB Int
56K v9.0	Yes	Yes	Yes
10/100 LAN	Yes	Yes	Yes
WIRELESS LAN	Antenna Only	Yes	Yes
WEIGHT	2.4Kg	2.4Kg	2.4Kg
WARRANTY	3 Years	3 Years	3 Years
WINDOWS 98SE	(C9717)	(C9719)	(C9724)
GST INC	**$5,999**	**$6,945**	**$7,999**
Rent* /wk	$54.68	$60.26	$69.40
WINDOWS 2000	(C9718)	(C9720)	(C9725)
GST INC	**$6,184**	**$7,129**	**$8,169**
Rent* /wk	$56.36	$61.85	$70.88

TOSHIBA Accessories

Toshiba Classic Leather Carry Bag (68408) **$199**

Toshiba ACAdapter Tecra (D1556) **$89**

Toshiba Battery 4000/9000 (D1554) **$137**

Toshiba Port replicator (D0406) **$259**

Toshiba ACAdapter Portégé (D1209) **$112**

Portégé 4000

Portege	4000-750
PROCESSOR	PIII 750MHz
RAM	128 MB
HARD DRIVE	20GB
SCREEN	12" TFT XGA
CD-ROM/DVD	DVD
PORT REPLICATOR	Optional
VIDEO RAM	16MB Ext
56k v9.0	Yes
10/100 LAN	Yes
WIRELESS LAN	Yes
WEIGHT	1.97 Kg
WARRANTY	3 Years
WINDOWS 98SE	(C9727)
GST INC	**$4,869**
Rent* /wk	$45.50
WINDOWS 2000	(C9728)
GST INC	**$5,057**
Rent* /wk	$46.09

The Portégé® is the ultimate statement in mobile computing with its Pentium® III power, large high resolution colour display, long battery life and easy functionality all packed into an ultra thin lightweight body (**only 2kg**) finished in sleek magnesium. With head turning style and work burning performance, the Portégé® is the perfect tool for the travelling executive ready to succeed in the new world.

Ultrathin, ultralight, ultraperformance

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TOSHIBA

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Web Direct www.ht.com.au/cat/toshiba

Presentation Delivery in style.

TLP-B2

The Toshiba TLP-B2 Projector is an innovative and mobile communication solution, ultra portable and ideal for improving your presentation fields. Flexible input through a range of devices from DVD, VCR, television and notebook computers.

Resolution: XGA 1,024x768

Brightness: 1,000 ANSI Lumens

Weight: 2.6 kg

(A1506) GST Inc **$7,899**

Rent* $68.53/wk

FLY BUYS 5,000 BONUS POINTS

Ask About... EXTENDED HARRIS TECHNOLOGY WARRANTY

FLY BUYS 5,000 BONUS POINTS

Collect 5000 Bonus Fly Buys points when you purchase A1506, D1732 or D1733 between 20/10/01 - 30/11/01

Projectors

With a full range of display options, the Toshiba portable projectors are flexible to ensure your presentation is delivered in style.

TLP-680 (without camera) FLY BUYS 5,000 BONUS POINTS

(D1732) GST Inc **$9,649** Rent* $82.38/wk

TLP-681 (with Camera) FLY BUYS 5,000 BONUS POINTS

(D1733) GST Inc **$11,249** Rent* $92.15/wk

The Toshiba 680/681 Projectors are flexible enough to deliver your presentations in style! The 681 model comes with a unique swivel and folding camera allowing projection of hard copy material.

Both projectors share the following features:

Resolution: XGA 1,024x768,

Brightness: 1,500 ANSI Lumens,

Weight: 3.7 kg for 680 and 4.5 kg for the 681

NO FURTHER DISCOUNTS AVAILABLE ON...

ALL TOSHIBA NOTEBOOKS AND ACCESSORIES SOLD FROM HARRIS TECHNOLOGY.

Blue Tooth

Wireless Solution

Toshiba's wireless solution empowers portable computer users to unplug from the restraints of conventional wired computing with a fully integrated Bluetooth PC Card, complete with SPANworks productivity software. Using short-range wireless radio communication Bluetooth facilitates fast and secure transmission of both voice and data at speeds of up to 1 Mbit/s (up to 20x faster than a standard).

Toshiba's Bluetooth PC Card can be used to connect portable computers, printers, digital mobile phones, PDAs, digital cameras, network access points and other mobile devices to one another and connect to the Internet or a LAN with out the need for wires or cables.

(B6572) GST Inc **$257**

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Fly Buys. Would you like FlyBuys with that?

hp invent

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hp omnibook XE3L & 500 Series

Whether you run your own business or work for a large enterprise, you need a notebook PC that helps you stay on top of it all. That 's why hp created the **Omnibook XE3L** — a convenient,reliable notebook that comes with everything you need to do business and have a little fun, too. Top performance, Internet working, multimedia,and instant access to your favourite applications .
Omnibook 500 — fast networking computer all in one reliable package with versatility,1.6kg carry weight and a expansion base with dual multibay capability.

Ask About...

EXTENDED HARRIS TECHNOLOGY WARRANTY

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

hp omnibook XE3L Celeron

hp OmniBook XE3L Celeron 850 13.3" TFT 128MB, 10GB 24x, 56k/LAN NiMH

- Intel® Celeron 850MHz
- 64MB RAM
- 13.3-inch XGA TFT
- 10 GB
- 24X CD, S3 Savage/IX-8MB
- Built-in 56K modem
- Built-in10/100 LAN
- Win 98SE/2000.
- 1-year warranty.

Superb performance and value

a great deal!

F3875W	F3875K
Windows 98 Second Edition	Windows 2000
(D1651) GST INC **$2,658**	(D1652) GST INC **$2,833**
Rent* $26.06/wk	Rent* $27.78/wk

with CD-ROM | Celeron 850Mhz | 13.3 display

Web Direct

See Web Direct Link (at top of page) for more products and latest info!

hp omnibook 500 PIII

hp Omnibook 500 notebook with Intel Pentium III 700MHz processor

- 128MB RAM
- 20GB HDD
- 12.1" XGA TFT display
- 16-bit Soundblaster Pro compatible sound
- Built-in56Kbps modem, 10/100 lan and 802.11b wireless networking
- Expansion Base has 2 module bays 1.44MB diskette drive module included)
- Warranty : 1 year return to HP

Ultra Light notebook PC

omnibook depicted with docked multimedia expansion base

F3481W	F3481K
Windows 98 Second Edition	Windows 2000
(D0211) GST INC **$5,524**	(D0210) GST INC **$5,745**
Rent* $50.35/wk	Rent* $52.36/wk

very light 1.6kg | PentiumIII 700Mhz | Expansion base

NOV 8

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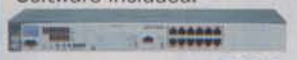
hp networks & servers

NEXT BUSINESS DAY ADVANCE REPLACEMENT - LIFETIME WARRANTY
PLEASE NOTE THAT PRICES ARE SUBJECT TO CHANGE ON ALL PRODUCTS

hp procurve switch 2512 & 2524

9.6GBPS BACKPLANE & AUTO-MDIX • Lowest Price 10/100 Managed Switch • Provides a rich, layer 2 feature set • Includes 2 transceiver slots for upgrade to a gigabit • Auto MDIX on all 10/100 and 100/1000 ports • Lifetime warranty for as long as you own the product • Wire-speed performance on all ports • FREE HP TopTools Management Software included.



procurve switch 2512
(12 port managed switch)
(A9703) GST Inc: **$1,609**

procurve switch 2524
(24 port managed switch)
(B0062) GST Inc: **$2,015**

hp procurve switch 2312 & 2324

Ideal for low-cost, unmanaged 10/100 connectivity • Lowest Price 10/100 Switch • Includes 2 Built-in Gigabit transceiver slots • Brings 10/100/1000 solutions to the market • Media-flexible ports for uplinks and server connections • HP quality, functionality and performance • Plug and play solution

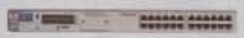
procurve switch 2312
(12 port managed switch)
(B0063) GST Inc: **$979** HOT NEW PRODUCT

procurve switch 2324
(24 port managed switch)
(B0064) GST Inc: **$1,389**

HP ProCurve Switch 408
Unmanaged 8 port 10/100 switch in a compact sized package. This switch offers half/full duplex, 10/100 autosensing on every port. Warranty: Lifetime, Exchange Next Day
(C9017) GST INC: **$405**

hp procurve switch modules

HOT NEW PRODUCT

hp procurve switch 2124 Transceiver

(D1512) GST INC: **$899**

hp procurve switch 2424M Gig Stack Kit
(78306) GST INC: **$426**

hp procurve Gigabit-SX Transceiver
(82140) GST INC: **$1,289**

hp procurve Gigabit-LX Transceiver
(82141) GST INC: **$2,115**

hp proCurve 100/1000-T Transceiver
(A9127) GST INC: **$925**

hp proCurve 100-FX SC Transceiver
(A9128) GST INC: **$715**

hp procurve switch 4108GL

The hp procurve switch 4108GL bundle is a high performance, Layer 2 modular switch, for high port-density needs at the edge of the network. The chassis bundle provides 72 half/full duplex, 10/100 autosensing ports, with hp auto MDIX, transceiver module for uplinks and 4 free module slots. In addition, the switch offers built-in management (including SNMP and RMON) and fast path technology for wire-speed switching.

(C5871) GST INC:
$17,495
Rent* $141.30/wk

HOT NEW PRODUCT

Fast Delivery Australia-Wide

hp netserver E200 PIII

The Server with the best price/performance value for small businesses.

Starts your small business off on the right Track. The hp NetServer pIII 1000 offers the best value-to-performance ratio of any major server supplier.
A desktop PC may do the job when you are starting out, but as your small business expands, it quickly out grows the ability to cut corners on something as fundamental as a server. And with the hp NetServer pIII 1000 leads the top tier server suppliers offering full server grade technology, functionality and performance for the price of a PC.

- Intel PIII 1GHz processor with 133MHz front side bus
- 128MB registered SD RAM standard
- 30 GB, IDE HDD
- Four PCI, one ISA
- Mouse & keyboard
- 1 year on-site warrenty

NEW

(C9996) GST INC: **$1,989**

Rent* $21.80/wk Call for long term *rental pricing

All systems include: 7 mass storage shelves (4 available after floppy, CD-ROM & 30GB disc), 5 expansion slots (4 PCI, 1 ISA combination), integrated 10/100 network interface, and easy set up CD.

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Delivery Australia-Wide

hp pocket pc & CDRW

HARRIS TECHNOLOGY™
for all your computer needs!

hp jornada 560 series

one of the lightest pocket PC's on the market

technical specifications	hp jornada 560 series
processor	206 MHz 32bit Intel(R) SA-1110
display	3.5 inch 16 bit colour TFT LCD
user interface	pen-and-touch interface handwriting recognition software
power	3V CR2032 coin-cell backup battery. AC adapter
input / output	serial port, AC input jack, stereo head phone jack
sound	audio speaker and microphone, voice recorder
dimensions	132 x 76.5 x 17.2 mm
weight	173g

F1865A
hp jornada 565
32 MB flash ROM
(D0845) GST INC **$1,399**
Rent* $15.33/wk

F2915A
hp jornada 568
64 MB flash ROM
(D0857) GST INC **$1,525**
Rent* $16.71/wk

Ask About...

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

hp CDRW 9140i & 9500i

Easier to install & use!

You can create data CD's, audio CD's, photo CD's and multimedia CD's. You can either write once (CD-R) or erase and re-write (CD-RW). Each CD holds up to 650MB of data or 74mins of audio.

Model	9140i	9500i
Speed	8x4x32	12x8x32
Copy & create universally readable CDs	hp MyCD	hp MyCD
CD creation using drag & drop	Adaptec Direct CD 3.01	Adaptec Direct CD 3.01
High speed CD-RW disc formatting	HP Fast Format	HP Fast Format
Full system backup	HP Simple Backup	HP Simple Backup
Mutlimedia organiser		Broderbund Multimedia Pro
Create stationery, greeting cards & more		Corel Print Office 2000
MP3 downloads	HP Music Jukebox	HP Music Jukebox
CD labelling	CD labeler	CD labeler
Included media	1xCD-R	1xCD-R, 1x high perf. CD-RW
Buffering	2MB	4MB
Able to format CD-RW disc under 3 minutes	Yes	Yes
Download MP3 files & store on CD	Yes	Yes
Read high performance CDRWmedia	Yes	Yes
Write & read normal CD-RW media	Yes	Yes
Part #	(A8090)	(A8087)
Inc GST	**$249**	**$299**

hp CD-Writer 8230e Drive

The hp CD-Writer 8230e drive is an external CD-Rewriteable drive with 4x 4x 6x performance. Read 6x, Write 4x CD-R and 4x CD-RW with 2MB (6 seconds at 2x). Use the drive to create, share, and store data, photos, music, and more on high capacity CDs.

(A9131) GST INC **$448**

DON'T FORGET your **Fly Buys** points!

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Business Solutions

Make Contact. Build Relationships. Get Results.

Compaq and ACT!™ offer From $1,725

This Compaq and ACT! contact management offer is the ultimate solution to manage your customers and grow your business.

- Forecast and track sales opportunities
- Keep important details from slipping through the cracks
- Maintain a record of every customer contact – such as meeting notes, letters, e-mails and proposals

Images not shown to scale

Save on COMPAQ server bundles refer to website link below
compaq.com.au/solutions/smallmedium

Fast Delivery Australia-Wide

COMPAQ ACT!™

iPAQ Desktop with Legacy Ports PLUS ACT! software

- Intel Celeron 800MHz processor
- Intel 815e chipset
- 128 MB/133MHz SDRAM (1 DIMM)
- 20GB Ultra ATA 100 Hard Drive (5400rpm)
- Integrated Intel 3D graphics
- Integrated Premier Sound featuring AC97 Audio
- Integrated Intel Pro/100+ with Alert on LAN
- Includes parallel, serial and PS2 ports
- Compaq Carbon PS/2 Scroll Mouse
- Compaq Carbon Easy Access PS/2 keyboard
- 24x CD-ROM multibay for iPAQ
- **V570 15" Standard Monitor- 2 Tone**
- Compaq 56K USB fax modem
- Microsoft Windows 98
- 1 year International Warranty
- ACT! contact management software

(D1748) GST Inc **$1,725**
Rent* $18.90/wk

- Intel PIII 1GHz processor
- Intel 815e chipset
- 128 MB/133MHz SDRAM (1 DIMM)
- 20GB Ultra ATA 100 Hard Drive (5400rpm)
- Integrated Intel 3D graphics
- Integrated Premier Sound featuring AC97 Audio
- Integrated Intel Pro/100+ with Alert on LAN
- Includes parallel, serial and PS2 ports
- Compaq Carbon PS/2 Scroll Mouse
- Compaq Carbon Easy Access PS/2 keyboard
- 24x CD-ROM multibay for iPAQ
- **V720 17" Standard Monitor- 2 Tone**
- Compaq 56K USB fax modem
- Microsoft Windows 2000/INT
- 1 year International Warranty
- ACT! contact managemnet software

(D1752) GST Inc **$2,445**
Rent* $23.97/wk

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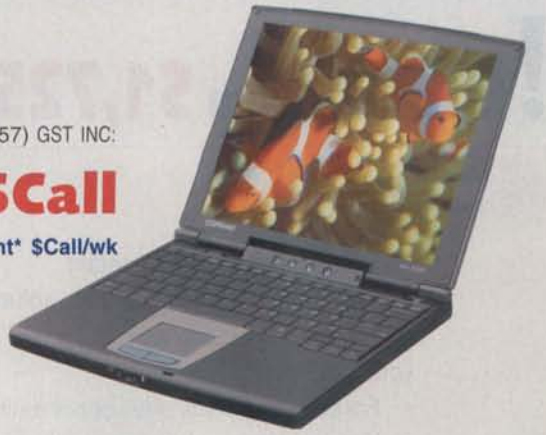
Notebooks and Wireless Technology

Evo Notebook N200



(D1657) GST INC:

$Call

Rent* $Call/wk

The Evo Notebook N200 offers extreme mobility and is feature rich. It is the lightest mini-notebook with all-day battery life.

- Weighs only 1.1kg
- Mobile Intel Pentium III 700MHz Processor
- 10.4" Colour TFT XGA display
- 192MB SDRAM
- 20GB Hard Disk Drive
- Integrated Modem and 10/100 Ethernet
- Microsoft Windows 2000

1 Year Limited International Warranty, including **Pick-up in Australia***

*Includes pick-up from anywhere within Australia, with a 48-hour service workshop turnaround repair time

Evo Notebook N400c

(C4909) GST INC:

$4,659

Rent* $43.54/wk

The Compaq Evo Notebook N400c is the designed with the highly mobile professional in mind, it packs mainstream computing features including wireless technologies into an ultra-thin and lightweight form factor.

- Mobile Intel Pentium III 850MHz processor
- 12.1" CTFT 1024 x 768 Display
- 128MB SDRAM exp. to 512MB
- Removable 20GB Hard Disk Drive
- Integrated Mini PCI v.90/56K modem and 10/100 NIC Combo
- Preinstalled Windows 2000/NT4 provided on QRCD
- OPTIONAL Multiport for modular wireless technology including 802.11b or Bluetooth.
- 3-year limited international warranty including **Pick-up in Australia***

* Includes pickup from anywhere in Australia with a 48-hour service workshop turnaround repair time.

Save on COMPAQ server bundles refer to website link below compaq.com.au/solutions/smallmedium

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The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

Compaq Wireless LAN Series

Networking is an ideal solution for home or office when you need to share devices, files or an internet connection. Compaq's Wireless LAN Products make networking simple. You save time and money as you can install it yourself in just minutes. There is no need to fuss with wiring and you can add users to your network as you need to by simply adding extra client cards.

Strategically position the Hardware Access Points around the office and remain connected to the network as you move from one end of the office to another.

WL310 SOHO Gateway

Connect your small wireless office to the web

(C3297) GST INC: **$739**

WL410 SMB Access Point

Bridge your wireless and ethernet networks

(C3298) GST INC: **$1,294**

WL510 Enterprise Access Point Extend those difficult to wire networks with this high performance wireless access point

(C3299) GST INC: **$1,845**

Install a PC Card (for notebooks), PCI Card (for desktop PC's) or a USB Card (notebooks or desktops) in each device connecting to the network

WL110 PC Card For notebooks + pocket PC

(C3294) GST INC: **$275**

WL210 PCI Card For desktops

(C3295) GST INC: **$374**

WL215 USB Client For USB desktops

(C3296) GST INC: **$319**

Ask About...

- Extend to a total of 3 Years Return to Base
- Extend to a total of 5 Years Return to Base
- Upgrade Return to Base of Warranty Extension to On-Site

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COMPAQ

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Web Direct www.ht.com.au/cat/compaq

Business Servers For Any Budget

New Generation Compaq ProLiant Servers: In A Class Of Their Own!

Small Business Budget Servers

ProLiant ML 330e

Best Value Server For A Business!

- Delivers easy-to-manage file, print & Internet sharing
- Intel Pentium III 933MHz processor with 133MHz front side bus
- 64MB ECC SD RAM (expandable to 2GB)
- 6 Available PCI Expansion Slots
- 20GB ATA/1000 Hard Drive (expeandable to 160GB)
- Include: Famous Insight Manager Software and SmartStart software suites
- Pre-failure warranty on Hard drives, processor and memory
- 3 Years Compaq Warranty on parts, 1 year on labour & on site(ask about our upgrades)

(C1542) GST INC: **$2,369**

Rent* $23.23/wk

ProLiant ML 330 Second Generation

The affordable Server for an Expanding Business!

- Delivers performance and data security at the best price.
- Ideal use with File/Print/Internet sharing, email & Small databases
- Dual processor capable Intel Pentium III with 133 MHz front side bus
- 128MB ECC SDRAM (expandable to 4GB)
- 6 Available PCI expansion slots (includes 4 x 64 bit PCI slots)
- Embedded Dual-channel Ultra ATA-100 with Integrated ATA RAID(ATA models) orIntegrated, dual-channel Ultra3 SCSI (SCSI models)
- Tower to Rack conversion option kit available
- Includes Famous Insight Manager and SmartStart Software suites
- Pre-failure warranty on Hard drives, processor and memory
- 1 year Compaq warranty, parts, labour, on site(ask about our upgrades)

(D1753) GST INC: **$Call**

Rent* $Call/wk

Business Work Group Server

ProLiant ML350 Second Generation

The Workgroup server that will grow with your business!

- Delivers constant uptime and expandability for future growth.
- Ideal use with corporate workgroups and growing businesses that demand expandable, easy to own, rack and tower solutions
- Dual Processor capable Intel Pentium III with 133 MHz front side bus and 512K on-die cache
- 128MB ECC SDRAM (expandable to 4GB)
- 6 Available PCI expansion slots (includes 5 x 64 bit PCI slots)
- Integrated dual-channel Ultra3 SCSI
- 6x 1" Hot-plug Hard drive bays
- Redundant Power supply optional
- Tower to Rack conversion option kit available
- Includes Famous Insight Manager and SmartStart Software suites
- Pre-failure warranty on Hard-Drive, Processors and Memory
- 3 Year Compaq Warranty, parts, labour, on site

(D1754) GST INC: **$Call**

Rent* $Call/wk

Corporate Class Server

ProLiant ML 370 Second Generation

For unprecedented performance and availability!

When it comes to performance, availability and versatility, the new Compaq ProLiant ML370 G2 server redefines the two-way server class!

- Ensures constant uptime with Hot pluggable Hard drives, cooling fans, PCI slots (2), and also optional Hot Plug secondary power supply. The all-new Compaq online spare memory
- Dual Capable Pentium III 1133MHz Flip Chip PGA system with 512k on die cache and 133MHz FSB
- 256MB of 133MHz ECC registered SDRAM memory (expandable to 6GB)
- Integrated Dual Channel Ultra 3 SCSI Controller
- 6- 1" Hot PLug Hard drive bays, 6 - 64bit PCI slots

Includes:

- New Compaq Smartstart Version 5.1 and Compaq Insight Manager Software
- Pre-failure warranty on Hard drives, processor and memory
- 3 Year Compaq Warranty, parts, labour, on site

(C7879) GST INC: **$5,669** Rent* $51.67/wk

COMPAQ Carepaq Services:

Installation Carepaq's for:
- Server
- Printer
- Software Setup

Software Support Carepaq:
OS & Application Telephone Support (10hrs x 5days) 5 Call Pack (C5962) GST INC: **$1,045**

Carepaq warranty upgrades available
- Same day on site • 24 x7 on site call for details

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The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

Manage your server from anywhere, with Compaq's Remote Insight Board - LOE only (A0392) GST INC: **$999**

Only when purchased with C1542, D1753, D1754 or C7879 during Nov 2001

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See Page 2 for Locations

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Cost Effective PCs & Monitors

Web Direct
See Web Direct Link (at top of page) for more products and latest info!

With more than 18 successful years in the IT industry, Ipex is ranked in the top 20 IT companies and top 5 Desktop/ Server manufacturers in Australia. Ipex offer systems to best suit your computing needs at a cost effective price.

Ask About... EXTENDED HARRIS TECHNOLOGY WARRANTY

Collect 5000 Bonus Fly Buys points when you purchase D1740 or D1741 between 20/10/01 - 30/11/01

IPEX M3304

The Ipex M3 Series Slim Office Desktop is ideal for business and corporate environments. Housed in a small form factor Slim Office Case and featuring Integrated LAN, Graphics and Audio onboard, this is the cost effective business PC.

IPEX M5402

When you need the power of Intel's Pentium 4 Processor at an affordable price, choose the Ipex M5 Series Pentium 4. Using the i845 chipset from Intel and utilising standard PC133 SDRAM ensures an easy upgrade path at minimal costs.

	IPEX M3304	IPEX M5402
Form Factor	Slim Office	Desktop Office
Processor	Intel® Celeron™ Processor 900MHz	Intel® Pentium® 4 Processor 1.5GHz Socket 478
HDD	20 GB - 5400 RPM	20 GB - 5400 RPM
RAM	128 MB SDRAM	128 MB SDRAM
LAN	Onboard	Onboard
Video	Onboard	NVIDIA 16 MB Video
Sound	Onboard	Onboard
CD-ROM	No	No
Modem	No	No
Operating System	Windows® XP Professional	Windows® XP Professional
Warranty	3 Years RTB	3 Years RTB
Rent*	$15.94/wk	$19.24 /wk
GST Inc	**$1,455**	**$1,756**
Part #	(D1740)	(D1741)

FLY BUYS 5,000 BONUS POINTS

IPEX CRT MONITORS (TCO COMPLIANT)

Monitor	15" CRT	17" CRT (pictured)
Rent*	-	-
GST Inc	**$345**	**$459**
Part #	(C5931)	(C5932)

Images for illustration purpose only

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Cost Effective PC's & Monitors

Ipex have a full range of Windows XP ready PC's. Take advantage of Microsoft's new Operating system with a new PC from Ipex. Choose from Windows XP Home or Professional Editions for home or business.

IPEX M7404

The flagship Intel Pentium 4 Processor, up to 2GHz, in the Ipex M7 Series Tower. Ideal for high end users including graphics and design professionals, the Ipex M7 Series meets the needs of all today's demanding applications. Experience the Ipex M7 Pentium 4 series to truly appreciate rich multimedia and the Internet.

IPEX SOHO TOWER

Everything you need in a PC for your home or small office. With Windows XP Home installed, take advantage of amazing graphics and sound capabilities. Enjoy the web and create CD's with a 56K Modem and CDRW as standard.

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery#
HARRIS TECHNOLOGY
#Delivery charges extra.

	IPEX M7404	IPEX SOHO TOWER
Form Factor	Duality Tower	T400 Tower
Processor	Intel® Pentium® 4 Processor 1.7 GHz Socket 423	Intel® Pentium® 4 Processor 1.5 GHz Socket 478
HDD	20 GB - 5400 RPM	20 GB IDE - 5400 RPM
RAM	128 MB RDRAM	128 MB SDRAM
LAN	Onboard	Onboard
Video	NVIDIA 16 MB Video	Ge force II Mx200 32MB
Sound	Onboard	SB Live! Sound Card
CD-ROM	No	12x10x32 CDRW
Modem	No	56K Internal
Operating System	Windows® XP Professional	Windows ® XP Home
Warranty	3 Years RTB	3 year RTB
Rent*	$21.86/wk	$23.55/wk
GST Inc	**$2,229**	**$2,149**
Part #	(D1742)	(D1743)

FLY BUYS 5,000 BONUS POINTS

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The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

IPEX LCD FLAT SCREEN MONITORS

Monitor	15" LCD	17" LCD
Rent*	$10.57 /wk	$19.17 /wk
GST Inc	**$985**	**$1,839**
Part #	(C9400)	(C9401)

Images for illustration purpose only

FLY BUYS 5,000 BONUS POINTS

Collect 5000 Bonus Fly Buys points when you purchase D1742 or D1743 between 20/10/01 - 30/11/01

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Collect 500 Bonus Fly Buys points when you purchase C7494, C9879, D1552 or D1555 between 20/10/01-30/11/01

FD Trinitron

- 19" FD Trinitron Display
- 0.24-0.25mm Aperture Grille Pitch
- 4 Way Powered USB Hub
- Dual Switchable Inputs (HD15 & BNC x 5)
- Compact, Low-Rise, Two-Tone Cabinet
- Southern Hemisphere Picture Tube
- Maximum Resolution 1920 x 1440 @ 60Hz
- Sony 3-year Warranty

(B7964) GST INC **$1,320**

FD Trinitron

- 21" FD Trinitron Display
- 0.24mm Aperture Grille Pitch
- 4 Way Powered USB Hub
- Dual Switchable Inputs (HD15 & BNC x 5)
- Compact, Low-Rise, Two-Tone Cabinet
- Southern Hemisphere Picture Tube
- Maximum Resolution 2048 x 1536 @ 60Hz
- Sony 3-year Warranty

(B7966) GST INC **$2,099**

SONY DIGITAL MEDIA

DDS Data Media

DGD120P 4-8GB DDS-2 (13262) GST INC: **$13**

DGD125P 12-24GB DDS-3 (66576) GST INC: **$29**

DGD150P 20-40GB DDS-4 (88711) GST INC: **$65**

AIT Data Media

SDX135C, 35-70GB AIT-1 Tape with 64KB MIC (B2626) GST INC: **$169**

SDX250C, 50-130GB AIT-2 Tape with 64KB MIC (95749) GST INC: **$218**

CD-R/RW KIT

- 16x Recorder, 10x ReWriter, 40x Playback
- Anti Buffer-Under Run Technology
- Supports Digital Audio Extraction
- Recording Software supplied
- Easy installation guide included

(C7494) GST INC **$293**

Memory Stick CD-R/RW Kit

MEMORY STICK

NEW

- Two high speed removable media drives in one
- Writes & Re-writes to Memory Stick and CD-R/RW media
- 24x Recorder, 10x Rewriting, 40x Playback
- Sony Buffer-Under-Run Technology
- Recording Software supplied

(C9879) GST INC **$439**

18.1" LCD Display

- Fine 0.2805mm Pixel Pitch
- Dual Switchable Inputs (Digital Video Interface and HD15)
- Maximum Resolution 1600 x 1200 @ 60 Hz
- Native Resolution 1280 x 1024 @ 85Hz
- Switchable USB Hub
- Sony 3-year Warranty (1 year on backlight)

(C8758) GST INC **$5,175**

15.1" LCD Display

- 15.1" XGA Display
- 0.30 Pixel Pitch
- Native Resolution 1024 x 768 @ 75Hz
- Built-in Stereo Speakers
- Zero Footprint
- Sony 3-year Warranty (1year on backlight)

(B0916) GST INC **$1,399**

Memory Stick Digital Still Cyber-shot Camera

DSC-F707

NEW

- 5.0 Mega Pixel
- Carl Zeiss Lens
- 5x Optical Zoom (10x Precision Digital Zoom)
- MPEG Movie EX
- Night Shot for MPEG & Stills
- 3x Burst mode
- Electronic View Finder
- Max Resolution (2560 x1920)

(D1552) GST INC **$2,959**

MEMORY STICK Cyber-shot

DSC-P3

NEW

- 2.8 Mega Pixel
- 3x Precision Digital Zoom
- AF illuminator
- MPEG Movie EX
- ISO Sensitivity
- 2x Burst Mode
- 1.5" LCD & View Finder
- Max Resolution(1920 x1440)

MEMORY STICK Cyber-shot

(D1555) GST INC **$1,239**

NO FURTHER DISCOUNTS AVAILABLE ON...

ALL SONY NOTEBOOKS & ACCESSORIES SOLD FROM HARRIS TECHNOLOGY.

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SONY

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VAIO - Video Audio Intergrated Operation

CD-ReWritable Kit

(C4442) GST INC
$685
*RENT: $7.50/WK

- 32X Max Playback
- Reads All Major Formats
- Supports High Speed ReWriting
- Accelerated Audio Modes
- IEEE 1394
- Motorised Tray Loading
- Large Buffer
- External Case

CD-R/RW Digital Camera

(C4276) GST INC
$2,419
*RENT: $23.72/WK

- CD-R/CD-RW Mavica Digital Still Camera (156 Meg Per CD)
- 3.3 Mega Pixel, Mini CD-R/RW Mavica Digital Still Camera
- 3x Optical Zoom (6x Digital)
- 1/1.8" Interlace Scan Super HAD CCD
- Carl Zeiss Vario Sonnar Lens (52mm Filter)

Memory Stick

Sony's tiny Memory Stick lets you enjoy seamless recording, transfer, storage and playback of audiovisual and other data. Through a wide range of Memory Stick compatible products, it gives you the full benefit of converging multimedia technologies.

MSA8A
(88647) GST INC:
$69

MSA16A
(86779) GST INC:
$94

MSA32A
(88654) GST INC:
$125

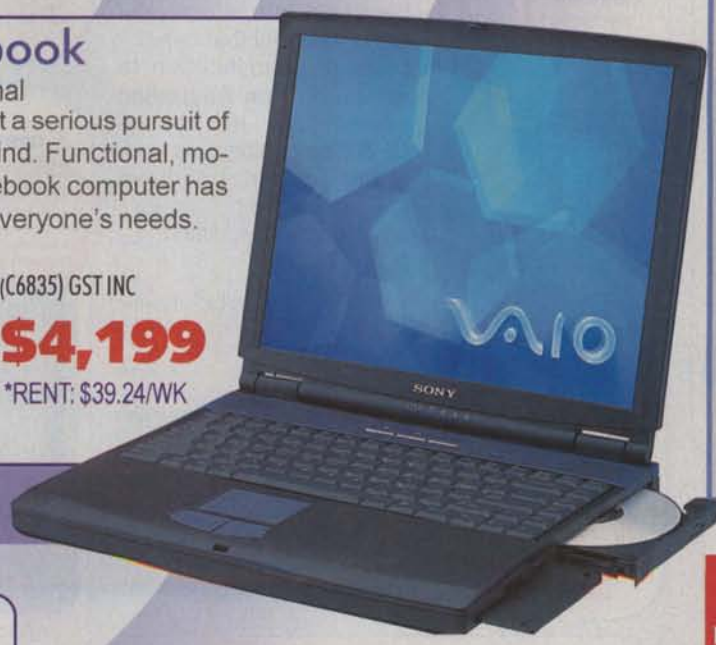
MSA64A
(88648) GST INC:
$205

MSA128A
(C5887) GST INC:
$375

PCGFX880K Notebook

with Windows 2000 Professional

Whether it's a pursuit of a serious nature or just a serious pursuit of fun, the PCGFX800 is designed with you in mind. Functional, mobile and entertaining, this all-in-one VAIO notebook computer has the power and connections to satisfy almost everyone's needs.



Features

• PIII 850MHz	• i.LINK
• 20GB HDD	• 15" XGA Display
• 128MB RAM	• DVD-ROM Drive
• AV Output	• Built-in Modem
• USB Port	• 10/100 Fast Ethernet

(C6835) GST INC
$4,199
*RENT: $39.24/WK

Digital Still Camera

(C7577) GST INC
$899
*RENT: $9.85/WK

- Memory Stick Digital Still Camera
- 1.3 Megapixel Resolution
- 6x Precision Digital Zoom (3x Optical Zoom)
- 1.5" Colour LCD

Digital Photo Printer

(A7106) GST INC
$949
*RENT: $10.15/WK

- Small footprint
- Dye Sublimation Printing (Ink Ribbon)
- Self-laminating printing (for long-life protection of photo's)
- Speed - approx 85 seconds/ sheet
- Print Sizes - 6" x 4" or 5.5" x 4"

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World Leaders in GPS Systems

HARRIS TECHNOLOGY™ for all your computer needs!

NEW Magellan Enav750M

Portable car navigation system

If you've ever been stuck in traffic, lost in an unfamiliar part of town, or are just wondering how to get where you want to go, the Magellan Enav 750M makes driving so simple that you have to try it to believe it. The Enav 750M lets you drive with confidence to hundreds of cities across Australia. Just select your destination by either street address, freeway entrance or exit, intersection, points of interest or from your personal address book - the Enav 750M does the rest.

(C9522) GST Inc RRP **$4,200**

Magellan MAP 330 & 330M

NEW

With marine navaids database

Boasting the most memory in its class, the Magellan MAP 330 is designed to meet the stringent navigation needs of the outdoor enthusiast, and for those who also travel out in the water, the MAP 330M is ideal with its marine Navaids database. Both units have a built 8MB basemap which includes Australian cities, highways, major roads, waterways and airports. The MAP 330M also includes fixed navigation aids, buoys and lighthouses.

Features:

- Powerful 12 parallel channel receiver and super sensitive quadrifilar antenna for fast satellite signal locking and accurate tracking.
- Built in 8MB map database displays major roads, highways, cities and other navigable details with advanced map database search. MAP 330M includes 1MB of memory for Marine Navaids database.
- 8Mb of FLASH memory for MAP 330, 7Mb of FLASH memory for MAP330M
- PC Upload/download capability for additional street detail via the optional MapSend Streets CDROM.

(C5893) GST Inc: **$849**

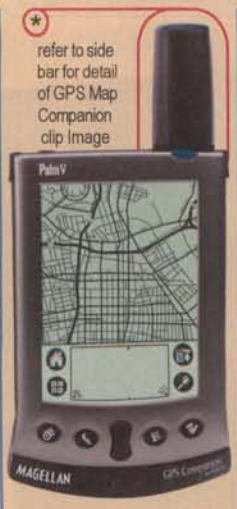
(D1036) GST Inc: **$895**

Magellan GPS Map Companion

Magellan GPS Map Companion

(C6108)

Magellan GPS Map Companion



refer to side bar for detail of GPS Map Companion clip Image

*Palm V series not included

(B7496) GST Inc: **$749**

Turn your Palm V or Vx handheld into a powerful navigation tool that can pinpoint your location to within 10m on Australian street maps. Just clip the GPS Companion onto your Palm V series handheld and the receiver pinpoints your location.

Features:

- Powerful 12 parallel channel receiver with powerful tracking in most environments.
- Up to 10 hours on 2 AAA alkaline batteries.
- Compatible with most Palm software that access GPS
- Displays AMG/MGA position, Lat/Long, Elevation, Trip, Speed, Heading, Bearing, Odometer, Waypoints, Routes, GPS battery life and more!
- Weighs only 110gms.

Magellan GPS 320 & 315

GPS320 has a built in marine navaids data base and a power / PC cable

The GPS 320 & 315 will take you where you want to go. Its built-in database puts more than 15,000 cities, additionally the GPS 320 includes marine navaids in the palm of your hand. Nine navigation screen's provide all the information you need on a high resolution, EL backlit display.

Features:

- Powerful 12 parallel-channel receiver
- Built in database of world-wide cities.
- 12hrs of continuous battery life on two AA batteries
- 1200 point SmartTrack records your path; BackTrack brings you home again.
- Store 500 waypoints.
- Weatherproof, compact and lightweight.

(B7508) GST Inc: **$599**

(B7506) GST Inc: **$499**

Australian Government Endorsed Supplier

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MapSend Streets For Magellan Map 330 & 330M

Magellan's MapSend Streets Australia software provides authorised Australian Street level data to be uploaded to your MAP330 to compliment the preloaded road and highway data. The latest Government map data is included on the 7 State based CD's available showing every street listed by suburb in each state.

(C7662) NSW + ACT GST Inc: FROM* **$149**

*Per state

Optional Accessories for GPS 310,315 ,320 & 330

- Vehicle Mounting Bracket (B7515) GST Inc: **$104**

*Aquapac, clear plastic weatherproof case to hold both Palm with Companion Clip-On.

*(Magellan GPS Map Companion ONLY) (C4290) GST Inc: From **$35**

- Power data cable adaptor (B7519) GST Inc: **$109**
- Power cable (B7509) GST Inc: **$55**

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AMERICAN POWER CONVERSION

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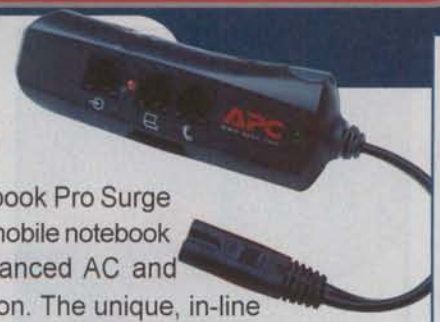
Power Back Up = Power Protection

APC Surge Arrest-PNote Pro®

Surge Arrest 5 Strip (A0098) GST INC **$56**

An APC SurgeArrest is your guarantee that your hardware and valuable electronics are protected regardless of lightning strikes and everyday unexpected power surges. SurgeArrest also offers the best protection from line noise which can cause glitches and errors in electronic operations and computer data.



PNote Pro (99592) GST INC **$46**

The SurgeArrest Notebook Pro Surge Protector provides the mobile notebook professional with advanced AC and telephone line protection. The unique, in-line design creates a compact, lightweight surge protector that is truly portable and appropriate for use in any country throughout the world. With built-in Excess Current Detection, the Notebook Pro warns you against potential modem damage. A Velcro mounting strap and 6 ft. telephone cord eliminate the need to carry any additional accessories.

Back-Ups for PC's!

350va (C5446) GST INC **$169**

500EI (C5878) GST INC **$245**

650va (56231) GST INC **$269**

APC Symmetra Power Array 8kVA, exp. to 16kVA (71087) GST INC **$13,529**

So good we use it ourselves!

APC Back Ups Pro® for Workstations

Smart battery backup & high performance surge suppression for Windows 95 & NT PCs

• PowerChute® Plus software lets your UPS shut down your applications gracefully in the event of an extended power failure • Additional outlet for protection of printers • Audible alarms • Phone/modem protection • User replaceable, hot swappable batteries

APC Back-UPS Pro **280si** (76636) GST INC **$260**

APC Back-UPS Pro **420si** (76637) GST INC **$349**

APC Back-UPS Pro **650si** (76638) GST INC **$485**

APC Smart-UPS Rack Mounts® for Servers

Smart-UPS 700, 1000, and 1400 2U Rack Mounts

Network power protection to increase availability of your system. APC Smart-UPS 2U Rackmount features include longer runtime to keep your system safe and a 2U design to save your valuable rack space by 30%. Hot swapping batteries is also now faster and easier with the replacement battery chassis tray.

APC Smart-UPS **2u700VA** (99595) GST INC **$725**

APC Smart-UPS **2u1000VA** (99596) GST INC **$1,029**

APC Smart-UPS **2u1400VA** (99597) GST INC **$1,445**

Ask About... Extended Harris Warranty

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1. Plug into AC power

2. Connect to Ethernet hub

3. Turn Snap Server on

INSTALL UP TO 960GB ON YOUR NETWORK IN MINUTES!!!

Ask About...

EXTENDED HARRIS TECHNOLOGY WARRANTY

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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SEE PAGE 64 FOR MORE DETAILS

The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

Delivering Even Greater Control, Security and Functionality

Ease of Use
- Auto-sensing 10Base-T/100Base-TX
- Automatic recognition of network types/clients
- Supports DHCP, BOOTP and RARP
- Configuration via Web browser

Features
- Embedded OS (unlimited user license)
- Easily supports 100 or more clients
- Disk space quota set by administrator
- Full functioning FTP server
- SNMP support
- SMART predictive disk failure analysis

Compatibility
- Simultaneous support for Windows '95, '98 2000, NT, NetWare, UNIX, Linux and Macintosh networks, and clients across TCP/IP, IPX, NetBEUI and AppleTalk networks
- Complete NFS 3.0 protocol support

Guarantee (+ Extended Guarantee Available)
- 1 yr parts & labour 40, 80 & 160GB
- 3 yr parts & labour 240, 400 & 960GB

Network Backup
- Compatible with Windows and Netware backup software, including Backup Exec, ARCserve and Microsoft backup software for Windows 95/ 98/ NT/ 2000/ Me

Network Security
- Set access permissions at file and directory level
- Integrates with Microsoft Domain Controllers or local user list

Price

40GB	(C0035)	GST Inc.	$1,499
Rent* /wk			$16.43
80GB	(D1206)	GST Inc.	$2,299
Rent* /wk			$20.54
160GB	(D1208)	GST Inc.	$4,099
Rent* /wk			$38.30
240GB	(A8119)	GST Inc.	$8,499
Rent* /wk			$73.74
400GB	(D1207)	GST Inc.	$12,999
Rent* /wk			$106.49
960GB	(C9169)	GST Inc.	$39,999
Rent* /wk			N/A

Snap Servers are engineered for one purpose: file sharing. That's why they can be up and running on a LAN in just minutes! Snap Servers offer you the perfect combination of quick and easy installation when compared to an NT server. Snap Servers are pre-configured to work in all major network environments, which means you just plug it in and turn it on, with no network downtime.

Snap! appliances

THE NEW SNAP SERVER 12000 AVAILABLE NOW!

New Snap Server 12000:
The Snap Server 12000 is designed to meet the capacity needs of larger workgroups and departmental customers and provides robust, high-availability features required for larger-capacity servers. The new Snap 12000 is easier to set-up and maintain than SCSI-attached RAID and provides a lower total cost of ownership than large NT or UNIX servers

Product Features:
- 3U (5.25") rack-mount form factor
- 12 hot-swap hard drives
- 960GB raw capacity (750GB in RAID 5) RAID 5, 1, 0
- Dual redundant, hot-swappable power supplies and cooling fans
- 10/100/Gigabit Ethernet (auto-sensing)

Available Now!!!

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Maxtor®

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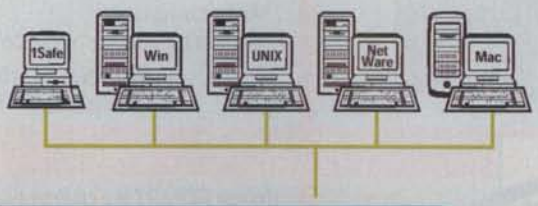
Network storage you can use

MaxAttach™ network storage

MaxAttach NAS 4100 File Server

- Windows, UNIX/Linux, NetWare and Macintosh file sharing
- NAS Powered by Windows operating system
- RAID Levels 0,1, and 5 data protection
- ADS/NDS/NIS Support
- SCSI port for Back-up
- No per-client licence
- Up to 320 GB in 1U
- NAS4100 320GB has Gigabit Ethernet
- NAS4100 160GB has 10/100 Ethernet



FILE SHARING:
MaxAttach NAS 4100 can be used for simultaneous multi-platform file sharing. File locking ensures that any file can be updated by only one client at a time. Clients and servers can be backed up to the MaxAttach file server using the included 1Safe for MaxAttach software.

The new MaxAttach NAS 4100 file server delivers seamless integration. With a Windows Powered operating system, the NAS 4100 is network storage that you can manage with the tools you have now. From backup support, to device management, to directory services, the NAS 4100 is the new network storage solution that you already know how to use.

NAS 4100 **160GB**
(B9954) GST INC **$6,895**
*RENT: $60.30 /wk

NAS 4100 **320GB**
(B9955) GST INC **$9,985**
*RENT: $85.34 /wk

NAS 4300 **400GB**
(C9243) GST INC **$13,590**
*RENT: $114.65/wk

- 400GB in 1U height
- PSM snapshot capability
- RAID 5, 1, and 0 data protection
- Active Directory support
- External SCSI port for local tape back-up
- Gigabit & dual 10/100 Ethernet ports
- Windows, UNIX/Linux, NetWare and Macintosh file sharing
- NAS Powered by Windows operating system

NEW

NAS 4300 **640GB**
(D1510) GST INC **$Call** on request

DON'T FORGET your Fly Buys points!

Web Direct

See Web Direct Link (at top of page) for more products and latest info!

RENTSMART

SEE PAGE 64 FOR MORE DETAILS

The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

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DIGITAL TAPE SOLUTIONS

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Web Direct www.ht.com.au/cat/digital

Next Generation Backup Solutions

media

DLT Tape Media IIIXT 15/30GB Tape
(68362) GST INC **$80**

DLT Tape IV Media 20/80GB
(71231) GST INC **$155**

DLT Cleaning Tapes
(97851) GST INC **$93**

Super DLT Media 110/220 GB
(B9825) GST INC **$330**

Exatape 112 - 8mm
(C1976) GST INC **$12**

Exatape 160 - 8mm
(C1980) GST INC **$22**

Exatape AME - 125m
(C1986) GST INC **$105**

Exatape AME- 170m
(77600)GST INC **$170**

Exatape AME 2-150m
(C1989)GST INC **$180**

Exatape 8mm Cleaning Tape
(C1982) GST INC **$29**

Exatape AME 18c Cleaning Tape (C1983)
GST INC **$36**

Ecrix VXA1 - V6 12/24 GB
(91103) GST INC **$89**

Ecrix VXA1 - V10 20/40 GB
(C3945) GST INC **$129**

Ecrix VXA1 - V17 33/66 GB
(91105) GST INC **$197**

Ecrix VXAI - 1m Cleaning Tape
(91104) GST INC **$102**

LTO Ultrium 100/200 GB Tape
(D1500) GST INC **$298**

Quantum

QUANTUM DLT TAPE DRIVES

Quantum DLT1 economy tape Internal Drives(88037) GST INC **$2,989**
Quantum DLT1 economy tape external Drives(88038) GST INC **$3,650**
Quantum DLT8000/S internal 40/80GB (82501) GST INC **$6,390**
Quantum DLT8000/ST external 40/80GB (82502) GST INC **$7,240**
Quantum SDLT220/S internal 110/220GB (B9821) GST INC **$11,570**
Quantum SDLT220/ST external 110/220GB (B9823) GST INC **$12,485**

LTO ULTRIUM

LTO Ultrium Tape Drive

- 100GB Native, and 200GB compressed capcity per tape.
- 16 Mb/Sec sustained, that is 57 GB/Hour!
- Ultra wide LVD SCSI interface and includes Data tape And cleaning tape.
- Compatible with most common backup software.

INTERNAL (D1509) GST INC **$10,350**
EXTERNAL (D1508) GST INC **$10,995**

StBERNARD

Update EXPERT, is a utility that allows Network managers to keep their NT and certain Microsoft product hotfixes and service packs up to date by analysing which service packs are installed on the NT servers or workstations. It also facilitates locating, downloading and installing the latest packs locally or remotely from a certral location.

75 Server Base System Licence!
(C4999) GST INC **$2,673**

Ecrix

VXA 1 TAPE DRIVE

- 33 GB native, 66 GB Compressed (using V17 tape)
- 3-6MB sec sustained, that's 21.6GB/Hr
- SCSI-LVD & new Firewire models available in white & translucent
- Variable speed operation matches data throughput to your computer
- LINUX and Apple Mac approved.
- Compatible with most backup software

INTERNAL (C1847) GST INC **$2,170**
EXTERNAL (C1915) GST INC **$2,615**
EXTERNAL BUNDLE PACK
with Retrospect Backup Software (B1856) GST INC **$2,495**

OVERLAND

DLT1 AUTOLOADER

- 400 GB native, 800 GB compressed capacity
- DLT1 Single Tape Drive included
- 10 tape capacity
- Overland DLT reliability
- LVD 68 pin SCSI interface
- Includes 1 data tape and cable
- 20 GB/Hr throughput.
- Optional On-site warranty.

(A0476) GST INC
$9,800

*** Super DLT and LTO models also available**

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COMSOL
COMMITMENT TO QUALITY

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Intelligent KVM and USB Products

SERVERLINK KVM SWITCHES

The ServerLink Infinity range of Auto KVM switches allow you to control multiple PCs or network servers with one monitor, keyboard and mouse. All ServerLink KVM switches feature **On-Screen-Display** and keyboard & mouse emulation to guarantee error free switching and flawless booting.

ServerLink Infinity Range

AUSTRALIAN MADE

SERVERLINK INFINITY

3 YEAR WARRANTY

SL-221	2 port ServerLink KVM for PS/2 only	(B3047)	$270
SL-221-P	2 port ServerLink KVM inc. 2 x 2m PS/2 cables	(B3048)	$310
SL-421	4 port ServerLink KVM for PS/2 only	(A9890)	$330
SL-421-P	4 port ServerLink KVM inc. 4 x 2m PS/2 cables	(B2759)	$425
SL-821	8 port ServerLink KVM for PS/2 only	(97888)	$979
SL-821-P	8 port ServerLink KVM inc. 8 x 2m PS/2 cables	(97889)	$1,159
SL-1621	16 port ServerLink KVM for PS/2 only	(97890)	$1,672
SL-1621-P	16 port ServerLink KVM inc. 16 x 2m PS/2 cables	(97891)	$2,019
SL-CKP-02	2m 3-in-1 Comp. to ServerLink cable for PS/2	(63972)	$27
SL-CKP-03	3m 3-in-1 Comp. to ServerLink cable for PS/2	(D0973)	$38
SL-CKP-05	5m 3-in-1 Comp. to ServerLink cable for PS/2	(63976)	$59

CYBEX AUTOVIEW 200 KVM SWITCH

Control up to 8 computers simultaneously from 2 locations. The second user can be up to 150 metres away using standard Cat5 UTP cabling.

CYBEX

AV200R-8	2 user 8 port KVM switch for PS/2 & AT/Serial	(97950)	$2,965
RMK-33	19" Rack mount kit for AV200R-8	(77284)	$55
CIFCA-4	1.2m 3-in-1 Comp. to AutoView cable for PS/2	(B6728)	$77
CIFCA-8	2.6m 3-in-1 Comp. to AutoView cable for PS/2	(B9703)	$120
CIFCA-15	5m 3-in-1 Comp. to AutoView cable for PS/2	(B5488)	$192

FULL RANGE OF CYBEX PRODUCTS AVAILABLE!

COMSOL USB KVM SWITCH

Control 4 USB computers from a single USB keyboard, USB mouse and VGA monitor. This USB KVM switch also allows the 4 computers to share 2 USB peripherals such as printers, scanners or storage devices

UKS-401	4 port USB KVM switch with 2 port USB Hub	(D0970)	$299
USB-AB-02	2m Computer to KVM cable for USB	(69356)	$9
USB-AB-05	5m Computer to KVM cable for USB	(69358)	$18
H15MF-02-H	2m Computer to KVM cable for VGA	(57884)	$19
H15MF-05-H	5m Computer to KVM cable for VGA	(60022)	$33

COMSOL USB HUBS

UH-201	2 port USB Hub	(82695)	$47
UH-401	4 port USB Hub	(82696)	$61
UH-701	7 port USB Hub	(82697)	$105

Fast Delivery Australia-Wide

COMSOL USB CONVERTERS

UPC-100	USB to IEEE1284 printer converter	(82692)	$55
UMC-100	USB to RS232 9 pin serial converter	(80782)	$70
UEC-100	USB to 10/100 Ethernet converter	(82594)	$145
UKMC-100	USB to PS/2 KB & Mouse converter	(B0557)	$70
USC-100	USB to SCSI 2 (HPD50M) converter	(D0937)	$180
UPCI-100	2 port USB PCI controller card	(B4493)	$44

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CardScan

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Web Direct www.ht.com.au/cat/cardscan

Why Type When You Can Scan

System Requirements:
- Windows 98, Windows 2000, Windows ME or later.
- 500 also supports Win 95, NT4
- Pentium processor or higher.
- 64MB of RAM.
- 35MB free hard disk space for a minimum installation and 50MB for full installation.
- CD-ROM drive.
- Modem for auto-dialing.
- Windows compatible network for sharing.
- USB or parallel port connection.

Eliminate lost cards, keep your leads up-to-date

You need CardScan

Transform business cards into contacts you can access from anywhere. Take your stack of business cards and feed them into the CardScan scanner. Within seconds, CardScan Software organizes all the information into an electronic address book.

- **QuickSearch™**
  Find contacts instantly by typing the first few letters of anything you can remember about a contact.
- **Notes and Categories**
  Add notes and categories to a single card or entire batches of cards while scanning.
- **AutoActions**
  Click on an email address and AutoEmail launches a pre-addressed email message. Click on a contact's web site and AutoBrowse takes you directly there. Click on a contact's address and AutoMap takes you to MapQuest™, providing you with a map of the area.
- **Improved International Capabilities**
  Accurately read and sort business card information from many countries including Australia, Belgium, Canada, France, Germany, Sweden, the United Kingdom and the United States.
- **Expanded Connectivity**
  Synchronize with all Palm™ handhelds, Microsoft® Outlook®, and more contact managers and PDAs (including Psion and Windows CE) than ever before.

Ask About...

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

(D1035) GST Inc
$699

CardScan 600c Scanner / V6 software
- 40% smaller than the CardScan 500 scanner.
- Scan and view business cards in color.
- Connect through USB (Universal Serial Bus) port.

(A4103) GST Inc
$569

CardScan 500 Scanner / V6 software
- Scan and view business cards in black-and-white.
- Connect through USB (Universal Serial Bus) or parallel port.

Also available for a limited time 300x V5, parallel port only. (C6770) GST Inc **$399**

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GFi

Harris Technology for all your computer needs!

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Better Things to do than Guard your Network all Day?

Mailessentials

Email content checking & anti-virus for Exchange

Mail essentials is the market leading email content security software. It acts as an Email Firewall and protects you from headline-hitting viruses such as Sircam, as well as email attacks targeted at your organization. In addition, Mail essentials adds important key features to your mail server, such as Anti-Spam, Email encryption, Email archiving, Disclaimers, Personalized auto responders, POP3 downloading and more.

Native Exchange 2000 version is now available which also scans internal mail!

from: 10 users

(C4380) GST INC **$677**

LANguard

Content Filtered & anti-virus for ISA server

LANguard for ISA Server helps you protect against the huge security risk posed by HTTP and FTP access from the workplace. Built on top of Microsoft ISA server, it scans all inbound material for viruses, Trojans or objectionable material. Using LANguard's powerful rules engine, you can configure rule sets that allow you to quarantine dangerous files for administrator approval.

LANguard also enables you to set up rules that can prevent unproductive use of the Internet at the workplace.

from: 25 users

(C4366) GST INC **$765**

LANguard

Intrusion detection through security event log monitoring

LANguard Security Event Log Monitor (S.E.L.M.) is a revolutionary new intrusion detection product that alerts you to any unauthorized activity occurring on your network by monitoring the security event logs of all your Windows NT/2000 servers and workstations. A firewall will offer no protection against attacks originating from within the company.

LANguard SELM alerts you to possible intrusions/attacks in real time.

from: 5 User Workstations

(C9889) GST INC **$265**

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Digi®

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Connectivity Solutions

Shair Office

802.11b Wireless Resource Sharing

- IP Sharing
- Wireless Networking
- Fiber Connectivity
- Firewall Security
- Printer Sharing
- Remote Access

(xxxxx) GST INC **$Call**

Digi Neo 4 Port Kit

- Four or eight port EIA-232 solutions on PCI platform
- Smallest form factor in industry
- Surge suppression
- Enhanced monitoring/diagnostic tool
- Windows, UNIX and Linux drivers
- Extensive cabling/connector options for DB-25, RJ-45 and DB-9 connections

Digi Neo 4 Port Board Only Model RAS	(D0978) GST INC	**$530**
Digi Neo 4 Port Kit: Model RAS	(D0975) GST INC	**$615**
Digi Neo 8 Port Board Only Model RAS	(D0976) GST INC	**$675**
Digi Neo 8 Port Kit Model RAS	(D0977) GST INC	**$840**

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Fax: 1300 13 6666 Email: sales@ht.com.au

See Page 2 for Locations

NETGEAR™

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Everybody's Connecting

Shared Internet Access

NETGEAR have a comprehensive range of Cable/DSL routers. All products offer standard shared internet access with NAT Firewall security and easy installation via web based configuration and DHCP.

The products are plug and play and are ideal for connection to either Cable/DSL or satellite broadband services. WWW.netgear.com.au offers specific installation information on both Telstra and Optus services.

RT 311 Cable/DSL router with 1 10/100 port (97719) GST INC **$339**

RT 314 Cable/DSL router with integrated 4 port 10/100 switch (A8862) GST INC **$419**

RP114 Cable/DSL router with integrated 4 port 10/100 switch and ability to control web content (C5592) GST INC **$429**

RO318 Cable/DSL Security router with integrated 8 port 10/100 switch (C4896) GST INC **$559**

NEW

FR318 Cable/DSL firewall router with integrated 8 port 10/100 switch upgrade to vpn end point (D1526) GST INC **$Call**

FV318 Cable/DSL V 5 times end point firewall router with 8 port 10/100 switch (C2298) GST INC **$899**

Web Direct

See Web Direct Link (at top of page) for more products and latest info!

Wireless Connectivity

The NETGEAR wireless family means that you never have to be tied down by your cabling again. Whether you are looking to add to your wired Ethernet network or set up a new network these standards based 802.11b products allow you to share network resources without the need for cabling. These plug and play devices are easy to install are WiFi certified and come with WEP encryption.

MA301 PCI Adapter Cradle (B9927) GST INC **$105**

MA401 PCMCIA Adapter (C8117) GST INC **$319**

ME102 Wireless Access Point (B9929) GST INC **$729**

MA 101 Wireless USB Adapter (C7110) GST INC **$335**

MR 314 Cable/DSL router with intergated 4 port 10/100 switch & built in access point (C5223) GST INC **$729**

Enquire for pricing on **Netgear 10 Mbps hubs.**

Printer Servers

The NETGEAR print servers enable you to connect your printers to a network for sharing amongst multiple PC's.

PS 110 10/100 Mbps Print Server, 2 parallel ports (67226) GST INC **$295**

PS 113 10/100 Mbps Print Server, 3 parallel ports (A3287) GST INC **$449**

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NETGEAR™

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Web Direct www.ht.com.au/cat/netgear

Everybody's Connecting

Modular Switches

NEW

NETGEAR has introduced a new range of modular switches that allow high performance non blocking 10/100 performance out of the box with the ability to add 2 high performance Gigabit modules now or at a later date. Fibre or copper modules are available and can be mixed. As with all NETGEAR products their installation is automatic.

FS726 24 Port 10/100 , 2 Module slots — NEW

(D0873) GST INC **$1,375**

FS750 48 Port 10/100, 2 Module slots — NEW

(D0874) GST INC **$2,598**

AG711T Copper module (D0921) GST INC **$729**

AG711F Fibre module (D0924) GST INC **$1,049**

Gigabit Solutions

These high performance Gigabit switches provides either fibre or copper backbone connectivity for power workgroups, data centres and server farms. No additional modules are required - each product is ready to install straight from the box.

GA 622T 32/64 bit PCI gigabit network card (B9943) GST INC **$359**

FS 509T 1Port 10/100BT Switch w/1 1000BT Uplink (D1004) GST INC **$889** — NEW

GS 504T 4 port 100/1000 (Copper) (A1375) GST INC **$2,449**

FS 518T 2 port 100/1000 with 16 ports 10/100 (A1374) GST INC **$2,195**

GS 508T 8 port 100/1000 gigabit switch (B9916) GST INC **$2,899**

FS 517TS 1 port 100/1000 and 16 port 10/100 stackable switch (copper) (C2299) GST INC **$1,649**

10/100 Switching Solutions

FS 105 5 port 10/100 autosensing switch (84722) GST INC **$169**

FS 516 16 port 10/100 autosensing and internal PSU/Vista (60522) GST INC **$859**

FS 108 8 port 10/100 autosensing switch (70905) GST INC **$299**

FS 524 24 port 10/100 switch (77549) GST INC **$979**

FS 116 16 port 10/100 autosensing switch (A5347) GST INC **$529**

FS 524S 24 port 10/100 switch - stackable (B6540) GST INC **$1,639**

NETGEAR Starter Kits

Everything you need to start networking right away. Within a few minutes you will be able to share files and printer, exchange emails, play interactive games and share access to the internet.

SB 105 5-Port/10Mb Hub 2x10/100, PCI, cables, internet sharing software (A3293) GST INC **$138**

FB 105 5-Port/10/100M Switch 2x10/100, PCI, cables, internet sharing software (A3935) GST INC **$218**

Network Cards

FA 311 Ethernet adapter 10/100 PCI (A1372) GST INC **$42**

FA 312 10/100 Wake on Lan Ethernet Adapter (A1373) GST INC **$55**

FA 411 10/100 Mbps PC Card (Without dongle) — NEW

(B9944) GST INC **$129**

FA 511 10/100 CardBus PC Card without dongle (81319) GST INC **$159**

Ask About... Extended Warranty

Call 1800 787 638 for 24 hour 7 days a week service support

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Fax: 1300 13 6666 Email: sales@ht.com.au

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Belkin Surge Protection is here..

UPS SERIES

Regulator PRO Silver Series

Features:

- 2 Year Unlimited Product Warranty
- 175 Joule Energy Rating
- 3 Battery Back Up/Surge Sockets
- 1 Surge Protection Only Socket
- Power Management Software Included
- 1.83m Power Cord
- Telephone/Fax/Modem and UTP
- (RJ45) Protection
- 1.83m Telephone Cable
- RS-232 Communication Cable
- EMI/RFI Filtration

350VA	500VA	650VA
F6C350zSER-SB	F6C500zSER-SB	F6C650zSER-SB
(192 Watts)	(300 Watts)	(360Watts)
(C9277)	(C9278)	(C9279)
GST Inc:	GST Inc:	GST Inc:
$183	**$249**	**$329**

Surge control is important because even small surges or spikes can eventually destroy or affect the performance of expensive electronic equipment such as a computer, phone, fax, TV, VCR, stereo or microwave. Damage can occur either instantaneously or over time as smaller surges cause the gradual deterioration of internal circuitry, to voltage fluctuations.

No Hassle Warranties Belkin offer the best Connected Equipment warranties in the business. Full warranty protection means your equipment is insured against damage due to power disturbances of all kinds - surges, spikes, even lightning strikes.

Home Office Range

Connected Equipment Warranties up to $25,000.

F5C205z4

Belkin's SurgeMaster line has been designed to protect entry-level computers, dot matrix printers, personal copiers and all other sensitive electronics in the home or office. Telephone/fax/modem protection

5 socket's

27,000 Amps of AC protection

(C4603) GST Inc: **$79**

Superior Grade

Connected Equipment Warranty up to $50,000 .

F5C206z2

Pentium III computers, audio/video equipment and office equipment need extra protection.

- 6-way Superior Grade range

Blocked space adapters

AC Line protection

(C4604) GST Inc: **$105**

Maximum Grade

Connected Equipment Warranties up to $80,000.

F5C208z2

Maximum Grade series ideal for protecting commercial business computers, ADSL and cable modems, high-end printers and copiers, and sensitive audio/video equipment such as satellite receivers and home cinema systems.

8 socket's

39,000 Amps of AC protection

(C4607) GST Inc: **$135**

Belkin Has All Of Your Mobility Solutions!

PDA ACCESSORIES

F8E391 Universal PDA Case Finegrain Leather-Black (B6767) GST Inc: **$35**

Tan (C4690) GST Inc: **$35**

F5U109 USB PDA Adapter (B6768) GST Inc: **$52**

F3X 1051-03 Hot Sync Cable for Palm III/VII (C4685) GST Inc: **$35**

USB pocket Hub

F5U007-UNV-AUS

The Belkin Pocket Hub allows you to instantly connect USB devices such as printers, scanners, external mice and keyboards, joysticks, digital cameras, or other USB hubs without having to restart your computer.

(C4577) GST Inc: **$65**

Optical MiniScroller™

F8E882

Smaller than the standard mouse, the Optical MiniScroller™ is perfect for travelers. No bulky mouse taking up prime space in your notebook bag. USB or PS/2 compatible, it features 8-directional scrolling and one-touch zoom control. It works with Windows™ 95, 98, Windows NT and W2000.

(C4699) GST Inc: **$38**

DockStation™

F5U120-PC-AUS

The DockStation™ combines four USB devices, one parallel device, one serial device, and two PS/2 ports with a single USB port on your PC. •Supports serial port speeds at up to 230 Kbps. •Includes a 2.5 Amp power supply to provide true 500mA down-stream current on USB ports.

(B6752) GST Inc: **$298**

Don't Forget...

USB Hub

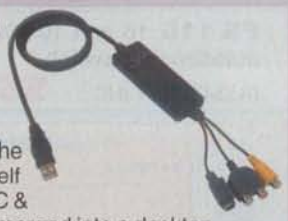
F5U101

A Belkin USB 4-port hub! This compact modular hub allows you to connect 4 USB devices to a single USB port, and it fits almost anywhere. Take advantage of full Plug-and-Play capability to make installation a breeze.

(96865) GST Inc: **$89**

USB VideoBus II

F5U208



You create the show yourself with your PC & camcorder merged into a desktop video studio by the Belkin USB VideoBus II. The Belkin USB VideoBus II, complete with MGI VideoWave III SE software, gives your PC the power to make stunning movies & more!

(B4412) GST Inc: **$145**

FireWire/USB ComboCard

F5U008-PC

Add two external and one internal FireWire ports, plus two additional USB ports with a simple, slide-in installation. Also capture digital video on your PC and edit using the included MGI Video Wave III SE and PhotoSuite III SE software.

(C3981) GST Inc: **$249**

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Belkin - KVM Switches allow one keyboard, video monitor and mouse to control multiple computers - from 2 to 256.

Omniview KVM Products

F1D102-AUS
F1D104-AUS

*D.C.=Daisy Chainable

F1D102-AUS- 2 Port KVM Switch, *D.C. (B6748) GST Inc: **$289**

F1D104-USB-AUS- 4 Port USB KVM Switch (C4661) GST Inc: **$489**

F1D201-AUS- 2 Port Reverse KVM Switch (C4662) GST Inc: **$319**

Omniview Pro KVM Products

F1D104-OSD-AUS
F1D108-OSD-AUS

F1D104-OSD-AUS- 4 Port KVM Switch (A7797) GST Inc: **$789**

F1D108-OSD-AUS- 8 Port with On-screen display (A7798) GST Inc: **$885**

F1D116-OSD-AUS- 16 Port with On-screen display PS/2 only (C4663) GST Inc: **$1,849**

F1D208-OSD-AUS- Matrix 2X8 with On-screen display (C4664) GST Inc: **$1,949**

Fast Delivery Australia-Wide

Omniview KVM Adapters

Convert standard PS/2 Keyboard,mouse and video signals.Allow Sun users to use the Belkin Omniview™, Omniview™ PRO, Omniview™ SE, or OmniCube™ KVM switches.

F1D082
PS/2 Sun Adapter (96911) GST Inc: **$344**

Omniview KVM Accessories

F1D103- Rackmount Kit (C4666) GST Inc: **$95**

F1D084- CAT5 KVM extender up to 150m (C4667) GST Inc: **$779**

F1D087- Keyboard/Mouse extender (C4668) GST Inc: **$124**

F1D088- Monitor extender (C4669) GST Inc: **$124**

F1D089- Keyboard splitter (C4670) GST Inc: **$124**

F1D090- Mouse splitter (C4671) GST Inc: **$124**

Omniview PS/2 KVM Cables

The easiest & neatest way to connect all your computers and servers to your PS/2 & USB KVM switches, providing image clarity for high-resolution applications.

F3X1835-06-GLD
All-in-one PS/2 Gold Series Kit, 1.8m (C4674) GST Inc: **$59**

F3X1835-10-GLD- All-in-one PS/2 Gold Series Kit, 3m (C4089) GST Inc: **$94**

F3X1835b15-GLD- All-in-one PS/2 Gold Series Kit, 4.5m- bag pack only (C4676) GST Inc: **$94**

F3X1835b25-GLD- All-in-one PS/2 Gold Series Kit, 7.5m- bag pack only (C4677) GST Inc: **$107**

Omniview USB KVM Cables

F3X1962-06- All-in-one USB Pro Series Plus Kit, 1.8m (C4680) GST Inc: **$37**

F3X1962-10- All-in-one USB Pro Series Plus Kit, 3m (C4681) GST Inc: **$64**

F3X1895-06-GLD- All-in-one USB Gold Series Kit, 1.8m (C4682) GST Inc: **$67**

F3X1895-10-GLD- All-in-one USB Gold Series Kit, 3m (C4683) GST Inc: **$74**

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Desktop and Mobile Network solutions

Belkin NIC Cards are the best solution for connecting your desktop PC or notebook to a cable or DSL Internet modem or building a 10/100 Base-T Ethernet network.

F5D5000
10/100Mbps PCI NIC

(C5581) GST Inc: **$32**

F5D5020
10/100Mbps PCMCIA NIC - 16 Bit

(C5583) GST Inc: **$134**

F5D5010
10/100Mbps CardBus NIC - 32 Bit

(C5582) GST Inc: **$149**

Network Hubs and Switches

F5D384

F5D386

F5D384- 10BT 5-Port HUB (C5584) GST Inc: **$66**

F5D386- 10/100BT 5-Port Switch (C5585) GST Inc: **$194**

F5D387- 10/100BT 8-Port Switch (C5586) GST Inc: **$294**

Network Starter Kits

F5D380

F5D381

F5D380- Home starter kit (C5587) GST Inc: **$69**

F5D381- Pro Network kit (C5588) GST Inc: **$164**

F5D382- Mobile Network kit (C5589) GST Inc: **$134**

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Small-Medium Business Networks

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ADSL / Modem Router

Service - Telstra Approved

NEW

DSL-504 DSL-504 ADSL Router with 4 port 10100 Switch
Connect single or multiple PC's on an Ethernet LAN to an ADSL (C7593) GST INC **$645**

DSL-200 USB ADSL Router with 4Port 10/100 Mbps Switch. ADSL Modem designed for high speed internet access (B7197) GST INC **$299**

DSL-300 Ethernet ADSL Modem
Connect single or multiple PC's on an Ethernet LAN to an ADSL (B7198) GST INC **$399**

DSL-100D Internal PCI ADSL Modem
Compatibile for Windows based PC's to connect via G.lite ot G.dmt (B7196) GST INC **$229**

DSL-500 ADSL Router
Connect single or multiple PC's on an Ethernet LAN to an ADSL (D0801) GST INC **$459**

ADSL / Cable Router

NEW

DI-713P 11 Mbps Wireless IP Residential Gateway for x DSL and Cable modems with switch and print server
(C7596) GST INC **$745**

DI-804 IP Residential Gateway for xDSL and Cable Modems with 4-port 10/100Mbps Switch. (C2361) GST INC **$369**

DI-701 10/100 IP Residential Gateway for xDSL and Cable Modems. Internet ready. (98249) GST INC **$285**

For all your small to medium business and home network needs please call for more information and pricing. We have an extensive range of fantastic D-Link products on our database.

10/100 Switches

DES-1024R+ 24-Port 10/100Mbs Fast Ethernet Unmanaged with 24 N-Way UTP ports.
(98256) GST INC **$849**

DES-1005D 5 Port 10/100Mbs Fast Ethernet Switch with 5 x N-Way UTP Ports. Plam Size (85101) GST INC **$149**

DES-1008D 8 Port 10/100Mbs Fats Ethernet Switch with 8 x N-Way UTP Ports. Palm Size (98254) GST INC **$239**

DES-1016R+ 16 Port 10/100Mbs Fast Ethernet Ethernet Unmanaged with 16 N-Way UTP Ports. Rackmount Size (98255) GST INC **$669**

DES-1032 32 Port 10/100Mbs Fast Ethernet Unmanaged Switch with 32 N-Way UTP Ports. Rackmount Size (B7165) GST INC **$1,299**

Gigabit Solution

DES-1218 Gigabit Ethernet Switch - Unmanaged - 16 port 10/100Mbs Fast Ethernet with optional 2 x 1000BaseSX ports (SC) Module DGE-550T PCI-bus 1000M Gigabit Ethernet Network Interface Card with RJ45 (Copper) Connector (B7166) GST INC **$975**

DES-1009G Gigabit ethernet Switch 8 Port 10/100Mbps Fast Ethernet Unmanaged Switch with 1 Port 1000Base T Gigabit (Copper)
(D1196) GST INC **$749**

DES-3326 24 Port 10/100Mbps Fast Ethernet Layer 3 Managed Switch with optional 2 Port Gigabit Module Slot
(D1197) GST INC **$3,229**

DES-3225G 24 Port 10/100Mbps Fast Ethernet Layer 3 Managed Switch with optional 2 Port Gigabit Module Slot
(90755) GST INC **$1,820**

NOV 30

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Home Networking

Wireless Solutions

NEW

DWL-905 Wireless LAN PCMCIA starter Kit
- 2 x Wireless LAN PCMCIA Cards (DWL-650)
- 1 x Wireless LAN Access Point (DWL-1000AP)

(C0713) GST INC **$1,189**

DWL-120 11Mbps Wireless LAN USB Adapter (A8487) GST INC **$349**

DWL-650 11 Mbps Wireless LAN PCMCIA Card (A9247) GST INC **$270**

DWL-500 11Mbps Wireless LAN PCI Card (A9241) GST INC **$375**

DWL-1000AP 11Mbps Wireless LAN Access Point (A9251) GST INC **$639**

Now you can collect Fly Buys points when you purchase from HARRIS TECHNOLOGY.

Ethernet Networking

DFE-910
Performance Network Kit 2 x 10/100 MB PCI Network adapters (88060) GST INC **$273**

DSS-5+ 5 Port 10/100 Mps Dual Speed Switch (89269) GST INC **$179**

DSS-8+ 8 Port 10/100 Mps Dual Speed Switch (C2935) GST INC **$289**

RDE-805TP 5 Port 10 Base-T Ethernet Unmanaged Hub (88048) GST INC **$89**

DFE-530TX+ PCI-bus10/100M Fast Ethernet Network Interface Card (88046) GST INC **$49**

DSS-16+ 16 Port 10/100 Mps Dual Speed Switch (D1525) GST INC **$Call**

HARRIS TECHNOLOGY. for all your computer needs!

USB Peripherals

DSB-H4 DSB-H4 4 Port USB Hub
4 USB Type A ports for Downstream connection to 4 USB devices, 1 USB Type B port for Upstream (C7580) GST INC **$75**

DSB-500 2 Port USB PCI Adapter (D0984) GST INC **$Call**

DSB-V100 USB Digital Video Capture Device (C2366) GST INC **$159**

DSB-C300 USB Digital Video Camera (C2364) GST INC **$118**

DSC-100 100K Dual Mode Camera (D0985) GST INC **$Call**

DSC-350 Dual mode Digital Still camera (B3268) GST INC **$312**

56K Modem

DFM-560E DFM-560E External 56K VOICE &Data
ITU-T V.90 and K56flex Auto-Detect 56Kbps capable download speed from Internet Service Provider supporting 56K Flex. (B6479) GST INC **$109**

DU-560M USB 56K Voice and Data Modem (98261) GST INC **$99**

DFM-560i Internal, 56k Voice and Data Modem (74361) GST INC **$69**

DKVM-2 Pro-connect 2 Port Keyboard-Video-Mouse Switch (C7576) GST INC **$199**

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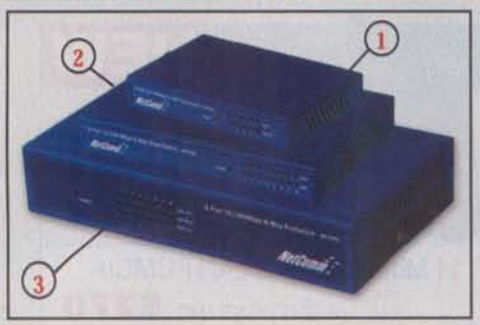
PC AUTHORITY QUALITY

Netcomm's Smart i-Share modem (SM4200) Winner of the PC Authority Quality Award!

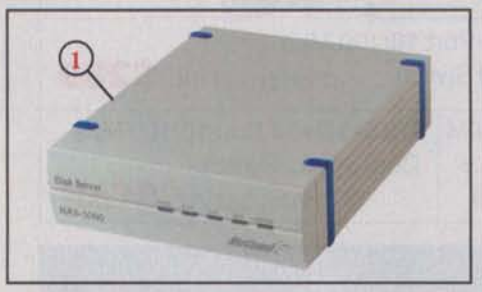


NETWORK SWITCHES

1. **NP2005** - 5 Port 10/100Mbps Auto-sensing Network SmartSwitch, Intelligent 'Store & Forward Technology', Durable mini metal case, external plug-pack. (D0966) GST INC **$139**
2. **NP2008** - 8 Port 10/100Mbps Auto-sensing Network SmartSwitch, Intelligent 'Store & Forward Technology', Durable mini metal case, external plug-pack. (D0967) GST INC **$199**
3. **NP2080** - 8 Port 10/100Mbps Auto-sensing High-Performance Network ProSwitch, Intelligent 'Store & Forward Technology', Universal 240volt internal power supply. (D0968) GST INC **$229**

NETWORK INTERFACE ADAPTORS

1. **NP1100** - High performance auto-sensing 32bit 10/100Mbps Fast Ethernet LAN PCI adaptor featuring N-Way auto-negotiating & Wake-On-LAN function. (C7657) GST INC **$33**
2. **NP1200** - 10/100Mbps Fast Ethernet 32bit PC Card with Tru-Connect technology. (D1166) GST INC **$99**
3. **NP1010** - USB LAN Key 10/100Mbps Fast Ethernet adaptor connects PC's via a USB port. (C7651) GST INC **$88**



NETWORK ATTACH STORAGE

1. NAS-1000 Disk Server Series - Add gigabytes of accessible, fast, hard-disk-drive storage to your network, without the cost, space, set-up and maintenance hassles of a fully-fledged file server. Features 20, 40, 60 & 80 Gigabyte models, In-built network print server, 10/100Mbps Fast Ethernet auto-sensing LAN connection, Simple configuration and administration, Full user - share & file level security.

NAS1020 (D0848) GST INC **$1,299** **NAS1040** (D0849) GST INC **$1,749**
NAS1060 (D0850) GST INC **$2,199** **NAS1080** (D0851) GST INC **$2,550**

INTERNET GATEWAY/ROUTER/FIREWALL/HUB

1. **SM4300** - SmartAccess Broadband/Cable Internet Gateway featuring Router, Firewall and 4 port 10Base-T network hub. (C5432) GST INC **$359**
2. **SM4200** - Smart-I-Share 56 Internet sharing Gateway featuring Router, Firewall, 4 port 10Base-T network hub and 56K V.90 modem. (A8868) GST INC **$454**

COMPACT FLASH & PCMCIA MODEMS/LAN ADAPTORS

1. **CM5700** - 56K V.90 Data/Fax Compact Flash Modem with PCMCIA adaptor. Designed for Handheld PC's, Notebooks or PDA's with available Compact Flash slot. (C5469) GST INC **$249**
2. **CM5600** - 56K V.90 Data/Fax PCMCIA Global Card Modem, GSM capable, Globally approved. (30658) GST INC **$299**
3. **CM3478** - TruConnect Combo PC Card featuring dongle less designed 56K V.90 Data/Fax modem and 10/100Mbps Fast Ethernet LAN adaptor in one convenient device. (99747) GST INC **$349**

SERIAL DATA/FAX/VOICE DESKTOP MODEMS

1. **BD3064S** - MyModem 56K V.90 Data/Fax/Voice modem, Leased line support, Digital Line protection, Sync/Async data transfer. (B3562) GST INC **$219**
2. **BD4065S** - Wave SP 56K V.90 Speaker phone Data/Fax/Voice modem. (C6308) GST INC **$179**
3. **AM5693** - Roadster II 56K v.90 Ultra Data/Fax/Voice modem. (61194) GST INC **$185**
4. **SM5690** - SmartModem 56K V.90 Professional Data/Fax/Voice Modem, 64Bit Encryption, Sync/Async Data Transfer. (55243) GST INC **$429**

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Surround Yourself With The Very Best

Cordless Freedom™ Optical

The ultimate cordless keyboard and optical mouse. This striking combination is cordless for less clutter, more style and more freedom. Seamlessly access and navigate the Internet at the touch of a button or the scroll of the iNav wheel. Intuitive multimedia controls are at your fingertips and allow you to control MP3s, DVDs and CDs from your keyboard. Every keystroke is made easy with Zero Degree Tilt, offering one of the slimmest keyframes available. Logitech's patented digital cordless radio technology is encrypted to secure your privacy. The included Cordless MouseMan® Optical will perform perfectly for years to come. 5-year warranty.

optical

Zero Degree Tilt design.

(C6106) GST Inc: $199

QuickCam® Pro 3000

With its CCD sensor, QuickCam Pro 3000 takes pictures and videos with true 640x480 resolution. Use its built-in microphone to make live video calls over the Internet and send pictures and videos with your emails. QuickCam software lets you easily setup a digital surveillance camera and broadcast live video and audio over the web. Add professional titles, fades and wipes to your videos with the included MGI software. Connection via USB. 2-Year warranty.

(B0805) GST Inc: $209

Cordless Freedom™ Pro

Ideal cordless keyboard and mouse combination for exceptional comfort, cordless freedom and aesthetic design. The split layout with a gentle curvature makes it easy to use. iTouch™ keys for easy access to the Internet and multimedia. 5-Year warranty.

(B1478) GST Inc: $215

SoundMan® S-20

Delivers high-definition sound, solid bass for your favourite CD/MP3 songs. Compact, attractive styling. Remote control with headphone jack. Includes digital music CD. 2-year warranty

(A5011) GST Inc: $89

Cordless MouseMan® Optical

This comfortable mouse for either hand combines advanced cordless and optical technologies. Digital Radio technology works in a two metre range without being pointed at the computer. Digital Security IDs lock out interference and make the receiver only listen to one mouse. Logitech's smart power management allows the mouse to work for months on the included AA batteries. The low battery indicator gives plenty of warning before needing to change batteries . PC/Mac. 5-year warranty.

(C1186) GST Inc: $129

optical

QuickCam Web (A2833) GST Inc: **$165**

Cordless Mouse (C2310) GST Inc: **$85**

TrackMan Live! (77753) GST Inc: **$285**

Optical Mouse (B9948) GST Inc: **$49**

Internet Navigator (D0560) GST Inc: **$69**

Deluxe Access 104 (B0819) GST Inc: **$38**

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Backup and Portable Storage

***ON REDEMPTION:**
Bonus CD's sent after registration of goods: registration form in boxes.
Only available while stocks last.

Verbatim

CopySmart CD Copier

BONUS FREE* CD's
*(refer to side panel for redemption details)

Copy discs with a single button press. Standalone - no PC required.

50 FREE* DISCS
8x4x32 (B2904) GST Inc **$990**
*RENT: $10.85/WK

100 FREE* DISCS
16x10x40 (B9843) GST Inc **$1,489**
*RENT: $16.32/WK

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Slim-line PC Card CD-ROM Drive

"Add a CD-ROM to your Laptop!"

This 24x CD-ROM drive will connect to any PC Card enabled PC or Notebook & is ideal for mobile computing.
(97766)
GST Inc **$328**

DVD8X
• PC Card Portable 8x DVD-ROM drive
(B2931)
GST Inc **$660**

CDRW4X
• PC Card Portable 4x4x20 CD-RW drive
(C7205)
GST Inc **$530**

PCI Cards

Add super fast serial and parallel port interfaces to any PCI equipped PC.
(90688)
Priced from
GST Inc **$77**

Digital Memory & Readers

PRETEC CompactFlash

With CompactFlash Digital Film you can increase the storage capacity of any compatible digital camera or PDA.

16MB CompactFlash	(B2920)	GST Inc **$45**
32MB CompactFlash	(B2921)	GST Inc **$75**
64MB CompactFlash	(B2922)	GST Inc **$119**
128MB CompactFlash	(B2923)	GST Inc **$219**

PRETEC SmartMedia

SmartMedia cards expand the storage capacity of any compatible digital camera. Suitable for digital cameras from Olympus, Fuji and others.

8MB SmartMedia	(B2914)	GST Inc **$35**
16MB SmartMedia	(B2915)	GST Inc **$45**
32MB SmartMedia	(B2916)	GST Inc **$69**
64MB SmartMedia	(B2917)	GST Inc **$129**
128MB SmartMedia	(C3680)	GST Inc **$285**
SmartMedia Card Adapter	(B2918)	GST Inc **$109**

PRETEC Flash ATA

These credit-card sized cards use a metal case for maximum ruggedness. Solid state construction offers shock resistance.

8MB Flash ATA	(B9860)	GST Inc **$85**
16MB Flash ATA	(B9861)	GST Inc **$129**
32MB Flash ATA	(B9862)	GST Inc **$149**
64MB Flash ATA	(B9863)	GST Inc **$249**
160MB Flash ATA	(B9865)	GST Inc **$513**
256MB Flash ATA	(B9866)	GST Inc **$799**

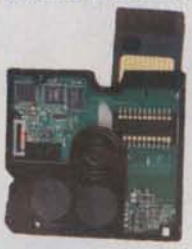
* Higher Capacities available

PRETEC MultiMediaCard

MultiMediaCard is the world's smallest removable flash storage card! Suitable for MP3 players, Mobile phones and Digital Video Cameras.

16MB MultiMediaCard	(B9871)	GST Inc **$69**
32MB MultiMediaCard	(B9873)	GST Inc **$99**
64MB MultiMediaCard	(B9878)	GST Inc **$179**

SMARTDISK FlashPath Floppy Adapters



Read your memory cards in your PC's floppy drive. Simply place the card into FlashPath and download your photos.

FlashPath SmartMedia Reader	(B2924)	GST Inc **$163**
FlashPath MultiMediaCard Reader	(B2925)	GST Inc **$163**

USB Digital Memory Readers

Exchange data between your PC, laptop, MP3 player or Digital Camera.

SmartMedia and CompactFlash Card Drive	(B2926)	GST Inc **$95**
ATA Card Drive	(96056)	GST Inc **$99**
SmartMedia, Memory Stick and CompactFlash Card Drive	(B9882)	GST Inc **$163**
SmartMedia, Secure Digital/MMC and CompactFlash Card Drive	(B9884)	GST Inc **$163**

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PRIMERA TECHNOLOGY, INC. GP Composer CD / DVD Duplicator

GP Composer
- 2 x DVD-R (General Data)
- 1 x DVD-RW
- 8 x CD-R

NEW

Automatic DVD and CD Duplication. Choose from one of the optional add on Primera printers as shown on left. Includes DVD and CD mastering software.

*RENT: $72.53/WK
(C5561) GST Inc **$8,359**

PRIMERA TECHNOLOGY, INC. Composer CD Duplicator

(Printer & stand not included)

Now 16x! 16x CD-R, 10 x CD-RW, 40 x Read CD Duplication system – 50 disc capacity. Printer optional extra.

Composer 16x CD-R Auto Duplicator
(C5708) GST Inc **$5,435**

PRIMERA TECHNOLOGY, INC. Conductor Printer Autoloader

(Printer & stand not included)

Print up to 50 CD's on your Signature III/IV/ Pro or Inscripta without having to manually load the discs!

Conductor Printer Autoloader
(B2934) GST Inc **$3,215**

PRIMERA TECHNOLOGY, INC. Signature IV CD Printer

- 1200x1200 dpi res
- Fast: 27 seconds per disc.

*RENT: $32.34/WK
(B9917) GST Inc
$3,298

PRIMERA TECHNOLOGY, INC. Signature Pro CD Printer

- 2400dpi
- Superfast
- Dual Ink Cartridges

*RENT: $38.02/WK (C3681)
GST Inc **$4,069**

RIMAGE™ Desktop Series

Burn and print - directly from your PC

NEW

Desktop 800
Single 12x Drive
and built in Signature IV printer
(B4413) GST Inc **$9,728**

Desktop 1000
Dual 12x Drive
and built in Signature IV printer
(B2968) GST Inc **$16,679**

Desktop 4000 Quad 12x Drive
and built in Signature IV printer
(B2969) GST Inc **$22,638**

RIMAGE™ Prism CD/DVD Printer

NEW

Full colour, high-resolution text and graphic thermal printing. High-volume speed to keep pace with production.

(C9510) GST Inc **$7,473**

PRIMERA TECHNOLOGY, INC. Inscripta Printer

- 610 x 305 dpi Thermal
- Durable finish

*RENT: $54.68/WK (B2932)
GST Inc **$5,999**

Unattended Copiers

MICROBOARDS Technology, Inc. Orbit 2 CD Duplicator

Stand Alone CD Duplicator with 1 16x CD-R drive. 50 CD Capacity. An internal CD-ROM Drive holds the master disc being duplicated.

"The Orbit II, aptly billed as "The Office Copier," is built to fit: it's easier to use than a fax machine, it occupies about the same space, and it comes at an alluring list price." Emedia Magazine

*RENT: $62.60/WK
(B9918) GST Inc **$7,215**

Orbit 2 CD Duplicator

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Sales: 1300 13 9999 Web: www.ht.com.au
Fax: 1300 13 6666 Email: sales@ht.com.au

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CD-R/CD-RW & DVD-R/DVD-RW: Storage for life

Verbatim Digital Media

CompactFlash

16MB (C8984) GST Inc: **$45**
32MB (C8986) GST Inc: **$75**
64MB (C8987) GST Inc: **$119**
128MB (D0020) GST Inc: **$219**

SmartMedia

16MB (C8989) GST Inc: **$45**
32MB (C8990) GST Inc: **$69**
64MB (C8991) GST Inc: **$129**

MultiMedia Card

16MB (C8994) GST Inc: **$69**
32MB (C8995) GST Inc: **$99**
64MB(C8996) GST Inc: **$179**

Diskettes

The world's No 1 Floppy Disk

11th DISK FREE!

(79452) GST Inc: **$6**

DataLifePlus CD-R - 10 Pack

74 Min.
650MB
1x - 16x
10 pack

(B4329) GST Inc: **$15**

DataLifePlus CD-R Audio CD-RW Audio

80 Min.
10 pack
recordable
(C7889) GST Inc: **$22**

80 Min.
CD-R
(D0011) GST Inc: **$3**

DataLifePlus CD-R - 80 Minute

80 Min.
700MB
1x - 16x
10 Pack

(B4710) GST Inc: **$16**

DataLifePlus Colours CD-R

80 Min. 700MB 1x - 12x coloured CD-R's in a 25 pack
(B1355) GST Inc: **$35**

21 min SlimCase Pocket Colours 16x 10Pack
(C9459) GST Inc: **$21**

DataLifePlus CD-R - Singles

74 Min. 650MB 1x - 16x Singles

(74740) GST Inc: **$2**

DataLife CD-R

- Third generation Phthalocyanine Recording Dye Technology
- Scratch Resistant Surface

80 Minute DataLife SlimCase 10 pack 16x
(C7091) GST Inc: **$13**

80 Minute DataLife Spindle 25 pack 16x
(C7093) GST Inc: **$35**

DataLifePlus DVD-R & DVD-RW

4.7 GB DVD-R for General Singles
(C8840) GST Inc: **$21**

4.7 GB DVD-RW (version 1.1) Singles
(C8841) GST Inc: **$42**

DataLifePlus CD-RW

650MB CD Rewritable 2x - 4x 20 pack in slimline cases

2x- 4x 20 pack cases
(C7097) GST Inc: **$69**

2x - 4x Singles
(77492) GST Inc: **$4**

4x -10x Singles
(B2658) GST Inc: **$5**

Did you know...

Verbatim DataLifePlus CD's represent the latest in technology. Featuring a proprietary blue Metal-Azo dye which has the best resistance to sunlight, silver reflective layer for optimum read and write performance and multispeed recording.

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Kodak

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Share Moments. Share Life™

Kodak DX3900

NEW!

The high-performance camera.

Set your own color mode, ISO, and lighting exposure settings to get your perfect picture. Thanks to 3.1MP resolution, you'll get excellent picture quality on prints up to 11" x 14". The DX3900 comes with 6X zoom (2X optical and 3X digital) and a COMPACTFLASH Card to keep you shooting longer. And with the DX3900's optional telephoto, wide-angle, and close-up lens attachments, you can extend your creativity.

- CCD resolution
- image resolution 3.3 megapixel
- 2160x1440 pixels
- burst maximum 8 pictures at 0.8MP resolution
- lens 35 mm - 70 mm, (35 mm equiv.)
- auto focus
- zoom 6X (2X optical, 3X digital)

FLY BUYS 1,000 BONUS POINTS

(C7689) GST Inc: **$1,149**

BONUS 32MB PICTURE CARD with theDX3900 Camera while stocks last or until further notice.

Kodak DX3700

NEW!

Great pictures made easy.

EasyShare DX3700 Digital Camera.It has 3.1 MP resolution for excellent picture quality up to 11" x 14". Getting closer to the fun is easy with the 3x digital zoom.

- 3.1MP resolution
- 3x digital zoom!
- 8MB internal memory
- Compatible with the Kodak EasyShareCamera Dock

(D0792) GST Inc: **$Call**

Kodak DX3215

NEW!

Making digital easy– one picture at a time.

Great pictures made easy

Want to get into digital with ease? You've found your camera. Introducing the KODAK EasyShare DX3215. This camera gets you started with 1.3MP resolution for great prints up to 5" x 7". A 4X zoom (2X optical and 2X digital) lets you get closer to the fun. It's the perfect camera to get you into digital picture-taking. • 1.3MP resolution • One-touch picture transfer• 8MB internal memory

FLY BUYS 1,000 BONUS POINTS

(C9539) GST Inc: **$469**

Kodak DC5000

Rugged, durable,

and easy-to-use, the KODAK DC5000 will help you get the job done. The DC5000's weatherproof body will hold up under the toughest circumstances. The 2X optical (30 – 60 mm) and 3X digital zoom let you choose wide angle or telephoto to take pictures in a variety of open spaces.

A practical, intuitive package that is easy to use but tough on the job

FLY BUYS 1,000 BONUS POINTS

(A3540) GST Inc: **$999**

Kodak DX3600

NEW!

Easy share dock system

KODAK DX3600 Digital Camera with Kodak easy share dock system. Get crisp, vibrant prints up to 8" x 10" thanks to its 2.2MP resolution and 3X digital zoom. Start shooting right away with 8MB of internal memory. The DX3600 comes equipped with a COMPACTFLASH Card expansion slot so you can boost your camera's memory capacity

Recording time only limited by the size of the compact flash being used.

FLY BUYS 1,000 BONUS POINTS

KODAK DX3600 (C5964) GST Inc: **$779**

Kodak DX3500

Simple-to-use

KODAK DX3500 Digital Camera . Get crisp, vibrant prints thanks to its 2.2MP resolution and 3X digital zoom. The DX3500 comes equipped with a COMPACTFLASH Card expansion slot so you can boost it's memory capacity.

- KODAK Picture Software lets you instantly view, edit, e-mail, and print your pictures.
- Get great-looking prints with 2.2MP resolution and 3X digital zoom.
- Continuous Video/movie mode and sound.

FLY BUYS 1,000 BONUS POINTS

(C9587) GST Inc: **$575**

Kodak MC3 portable media device

All the multimedia you've ever wanted in one little player. Click into digital video mode to shoot funny movies or snap a few digital pictures. Download your favorite MP3s and take them with you, listening via ear buds or through your boom box or car stereo. It's one of the only MP3 players with a reflective color preview screen, so you can use it even in bright sunlight. Transferring to your PC is a breeze. It even lets you combine your pictures, music and video into unique music videos.

BONUS 32MB PIC CARD with this MC3 player until stocks last

(B9818) GST Inc: **$399**

KODAK PICTURE CARDS

32MB Picture Card (62677) GST Inc: **$75**

64MB Picture Card (82249) GST Inc: **$123**

96MB Picture Card (88332) GST Inc: **$195**

KODAK ACCESSORIES

Premium Camera Bag (82273) GST Inc: **$49**

FLY BUYS 1,000 BONUS POINTS

Collect 1000 Bonus Fly Buys points when you purchase C7689, C9539, A3540, C5964 or C6587 between 20/10/01 - 30/11/01

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Turn your senses

NEC MultiSync LCD1530V

15" LCD Monitor
1024 x 768

(C6055) GST Inc: **$995**

V530
15" CRT Monitor
1280 x 1024
(89125) GST Inc:
$289

V730
17" CRT Monitor
1280 x 1024
(B7522) GST Inc:
$389

V930
19" CRT Monitor
1600 x 1200
(C9739) GST Inc:
$649

NEC LAUNCHES NEW RANGE OF NATURAL FLAT CRT MONITORS

FE700+
17" CRT Monitor
1280 x 1024 max res
Flat Aperture Grille
(D1191) GST Inc:
$579

FE750+
17" CRT Monitor
1600 x 1224 max res
Flat Aperture Grille
(D1192) GST Inc:
$629

FE950+
19" CRT Monitor
1792 x 1344 max res
Flat Aperture Grille
(D1193) GST Inc:
$1,079

FP1355
22" CRT Monitor
2048 x 1536 max res
Flat Aperture Grille
(D1194) GST Inc:
$1,895

Ask About...

EXTENDED HARRIS TECHNOLOGY WARRANTY

- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

NEC HAS A SELECTION OF OVER 20 DIFFERENT MONITORS AND A WIDE RANGE OF DATA PROJECTORS

LCD1830
18" LCD Monitor
1280 x 1024
(C8762) GST Inc:
$2,859

VT45
SVGA; 800 x 600
1000 ANSI Lumens
Horizontal & Vertical Lens Shift
Weighs only 2.5kg
(D1195) GST Inc: **$4,698**

Super Thin!

LCD1850x
18" LCD Monitor Ambix,
1280x1024 Max. Slim Bezel
(D1199) GST Inc:
$3,799

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High-breed Monitors

SyncMaster 560V TFT 15 inch monitor

TFT LCD Features:

Most advanced image scaling The SyncMaster 570s TFT monitor is making use of 2nd order interpolation to deliver the best-scaled image possible at any occasion. Videos with resolutions lower than the monitor's native resolution, 1024x768, are automatically scaled to fill the screen. Fast and accurate auto adjustment.

Specifications

- 15" entry level TFT monitor,ivory colour
- 1024x768@85hz
- Viewing Angle:120o/110o
- Pixel Pitch:0.297
- Fast auto adjustment
- Low cost, high performance
- TCO '99 certified
- Colour Solution (Colorific s/w)
- Pivo Enabled a : Windows2000 users can get software upgrade directly

WHILE STOCKS LAST!

(C5783) GST Inc: **$985**

SyncMaster 753df 17 inch monitor

SOHO Series Features:

Flatter images are easier on the eyes and slimmer products save on space and make users comfortable in their working environment. That´s real value. And that´s also what makes Samsung the World´s Number 1 Monitor manufacturer.

Specifications

- 17"(16" Viewable)
- 0.20mm dot pitch (horizontal)
- 1280 x 1024 @ 66Hz Maximum Resolution
- DynaFlat - Infinitely Flat Tube
- Smart III surface treatment (anti-static & anti-glare)
- On Screen Digital Display
- Plug & Play Compatibility
- MPR-II/NUTEK certified

(C1283) GST Inc: **$549**

SyncMaster 955df 19 inch monitor

Graphix Pro Series Features:

Samsung continues to spearhead the monitor market in meeting customer´s needs, built on its reputation as a leading provider of the highest quality monitors utilising the latest technologies to develop products to meet customers demands. Samsung´s commitment to customer satisfaction and leadership in the monitor industry has been proven by the value that Samsung monitors provide its customers.

Specifications

- Model No.: 955df 19" (18" Viewable)
- 0.20mm dot pitch (Horizontal)
- 1600 x 1200 @68Hz Maximum Resolution
- DYNA Flat - Infinitely Flat Tube
- Smart III Surface Treatment (Anti-Static & Anti-Glare)
- Onscreen Digital Display
- MPR-II/NUTEK Certified
- Plug & Play Capability

(C3975) GST Inc: **$964**

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Philips 3 Year Parts & Labour Warranty*

* Conditions apply

NEW! WORLD'S SLIMMEST LCD MONITORS (61mm with integrated power supply)!!

150B2B 15" LCD Monitor

Also availabe in black colour

(C7338)GST Inc: **$1,395**

- 15" colour LCD monitor
- Recommended resolution: 1024x768 at 60Hz
- VGA analog input
- pixel pitch: 0.297 x 0.297mm
- Adjustable tilt and swivel function
- AUTO adjustment
- Optional multi-media base

107T 17" Flat Colour Monitor

(D0187) GST Inc: **$549**

- LightFrame Technology
- XSD – max depth 419mm/16.5"
- VIS: 16.0" – MPRII Certified
- Max res:1280x1024, max hf: 70Hz
- Flicker Free Displey at 1024x768 at 85Hz
- High Contrast CRT with high-res
- 0.25mm dot pitch (0.21 hdp)
- Plug & Play for Mac and PC
- Optional multi-media base

Ask About...

- Extend to a total of 3 Years Return to Base
- Extend to a total of 5 Years Return to Base
- Upgrade Return to Base of Warranty Extension to On-Site

New Sound Card Just Launched In Australia!

(C7336) GST Inc: **$249**

- **PSC706 PCI sound card** capable of playing all movies, games, and music in fully accelerated true 5.1 surround sound to ensure the ultra realistic surround sound experience
- Turns all stereo sources into, distinct 5.1 channel channels, using patented QSound algorithm.
- S/PDIF in/out for connection to extenal equipment

- Includes: Dolby Digital™ /AC3 compatible PowerDVD™ player software
- Hear up to 96 distinct high-impact 3D sound from games, movies, music and external sources using two, four, or six speakers.
- Included software: QSound AudioPix™, Sonic Foundry® SIREN Xpress™, Acid XPress™

(C7337) GST Inc: **$169**

- **PSC705 PCI sound card**
- Turn any stereo source into 5.1 surround sound.
- Play all games in 5.1-channel surround sound, including EAX™ 2.0, A3D™ 1.0 and even ordinary stereo games!
- Full compatibility with EAX™ 1.0, EAX™ 2.0 and A3D™ 1.0 games
- Hear up to 64 distinct high-impact 3D sound from games, movies, music, and external sources using two, four, or six speakers. It sounds like you are in the game or concert
- Included software: Sonic Foundry® SIREN Xpress™, Acid XPress™, QSound AudioPix™

HARRIS TECHNOLOGY™ for all your computer needs!

Speaker Range

(C7334) GST Inc: **$299**

- ANALOGUE MULTIMEDIA MULTI-CHANNEL SPEAKER SYSTEM
- Active 80 watts (RMS) Total Power
- wOOx (TM) Bass Driver Technology
- Soft Flat Panel Satellite Speakers
- Wireless Remote Control with patented technology
- Digital Sound Control for Game / Speech/ Music
- Input Selector - choose up to 3 audio sources at the same time
- Easy placement speakers - vertical / horizontal / wall mountable
- Magnetically shielded

(A8907) GST Inc: **$115**

- Compact Powerful Subwoofer
- High Clarity Satellite Speakers
- Remote Control
- ANALOGUE MULTIMEDIA SPEAKER SYSTEM
- Active High Power - 20 Watts(RMS) - 3 piece speaker system for PC, CD player and other audio video sources
- rich deep bass
- "Bass Boost"
- Magnetically Shielded

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iomega

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Smart Storage Solutions

Network Attached Storage

NAS 160GB

Iomega serves up performance! Iomega® NAS 160GB servers, with Windows 2000 technology and multiple high-speed interfaces Ethernet and Ultra 160 SCSI. Includes free 20-seat license for QuikSync™ 3 automatic client backup software.

(C5567) GST Inc: **$8,275**

NAS 320GB

Iomega serves up performance! Iomega® NAS 320GB servers, with Windows® 2000 technology and multiple high-speed interfaces for 10/100 and Gigabit Ethernet and Ultra 160 SCSI. Includes free 50-seat license for QuikSync™ 3 automatic client backup software.

(C5568) GST Inc: **$11,775**

Peerless

The next generation in high-capacity removable storage. Iomega's Peerless(TM) drive system offers 10GB and 20GB disks, interchangeable interfaces, and 15MB/sec transfer rates for stunning performance. Firewire® and USB 1.1 interfaces available.

(C3525) GST Inc: **$829**

Zip 100MB disk: (23772) GST Inc: **$25**

10-pack: (21889) GST Inc: **$189**

Zip drive carry case (31823) GST Inc: **$49**

Zip SCSI cable (46304) GST Inc: **$35**

Zip disk labels 20-pack (48059) GST Inc: **$5**

Jaz 2GB External Drive (A4022) GST Inc: **$755**

Jaz 2GB disk (61652) GST Inc: **$209**

Jaz 2GB 3-pack (57271) GST Inc: **$595**

Jaz 1GB disk (24218) GST Inc: **$199**

Jaz 1GB 3-pack (32844) GST Inc: **$589**

Predator

Iomega Predator CD-RW drive

Iomega® Predator(TM) Firewire (8x4x32) drive
Announcing the latest addition to the hottest looking external CDRW in the Iomega range - the new Predator with Firewire connection. PC and Mac compatible, the new Predator Firewire allows true drive speed of 8x4x32, and provides versatility with interchangeable USB & PCMCIA adapters.

Predator™ USB Iomega CD-RW External
(B4416) GST Inc: **$549**

Predator™ Firewire 8x4x32
(C2413) GST Inc: **$685**

Iomega CD-RW

CD-RW Drive

Iomega ZipCDRW Internal drive is the ideal way to store, share and archive information in a common 650MB format. Compatible with Windows 2000. Also ships with Adaptec Easy CD Creator v4.02c and Direct CD 3.01.

Iomega CD-RW™ Internal 16x10x40
(C2414) GST Inc: **$549**

Iomega CD-RW™USB External 4x4x6
(92623) GST Inc: **$449**

Host Powered 250 USB

NEW – Host-powered Zip® 250MB USB drive Now it's even easier to take your information with you. The Zip® 250 USB drive is now available with a USB cable that provides both data and power, so you don't need any external power source. Its easy to connect (just plug it in) and easy to launch (no rebooting)! This new drive is compatible with most major operating systems and all Zip 100MB and 250MB Zip disks.

Host powered 250 USB Ext
(B6404) GST Inc: **$350**

Not all items are in stock at all stores but can be ordered!
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Multimedia: DVD & Blank Media

Fast Delivery Australia-Wide

Pioneer DVR-A06SZ 16x SLOT LOADING DVD-ROM DRIVE UPGRADE KIT

Includes: 5 x DVD movie rental vouchers from Blockbuster Video
(included inside product box- see voucher for conditions and expiry)

NEW

FEATURES
- 16x for DVD, 40x for CD
- Ultra DMA66
- Super quiet mechanism
- Vertical or horizontal mounting

INCLUDES:
- Pioneer DVD-ROM Drive (2 year warranty)
- Power DVD software decoder
- Mounting screws & audio cable

DVR-A06SZ (D1015) GST Inc: **$199 RRP**

Web Direct

See Web Direct Link (at top of page) for more products and latest info!

Pioneer DVR-A03 DVD-R/RW DRIVE

One drive... One complete recording solution!

> FEATURES

Writes: DVD-R (2x), CD-R (8x), DVD-RW (1x), CD-RW (4x)

Reads: DVD-ROM, DVD-Video, DVD-R, DVD-RW, CD-ROM, CD-R, CD-RW, CD-TEXT, Photo CD, Audio CD

> INCLUDES
- SONIC MyDVD Authoring Software
- PrimoDVD Writing Software by Veritas
- STAEDTLER LUMOCOLOR pen
- Power DVD software decoder
- 2 x DVD-R Media
- 5 x CD-R Media
- 1 x DVD-RW

DVR-A03 (C3847) GST Inc: **$1,595**

DON'T FORGET your Fly Buys points!

Pioneer DVD-R MEDIA

• Jewel Case • Memory-capacity of 4.7GB • Suitable for DVD Video & Data backup • Playable on both DVD-Video players & DVD-ROM drives • Commercial and Home DVD-Video production • Large sized data archive storage (not for use with Pioneer DVR-S201 authoring drive)

DVS-R470SDF (B9971) GST Inc: **$22**

DVS-RP470SDF •White printable version (C2322) GST Inc: **$26**

Pioneer DVD-RW MEDIA

Rewritable DVD media : Jewel case : Memory capacity of 4.7GB: Suitable for DVD video & data : (not for use with Pioneer DVR-S201 authoring drive)

DVS-RW470SD (C2326) GST Inc: **$38**

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CD-R/W & Caching Towers

PlexWriter 24/10/40A-IDE

High speed – Fastest in the world. High Quality – New writing strategy – POWEREC II High Reliability – Save your disc – BURN Proof.

The PlexWriter 24/10/40A E-IDE (ATAPI) drive, with built-in BURN-Proof technology, delivers exceptionally fast performance in a professional 3-in-1 CD solution, while upholding the legendary Plextor reliability.

How does PoweRec-II function?

PoweRec-II checks the quality of a disc in order to set up the appropriate writing speed and optimised laser power for the disc. This technology promises, in Zone CLV, excellent writing in each area of the disc.

The PlexWriter records CD-R discs at 24X speed, rewrites CD-RWs at 10X, and reads back all CDs at 40 speed. BURN Proof (Buffer Under RuN - Proof) enables you to stop writing before buffer under run errors occur and then to continue writing by tying last point of recording and the next start point ... no more drink coasters. These drives are the best of the best. Comes with software, cables, manuals, ready for installation.

Now you can collect Fly Buys points when you purchase from HARRIS TECHNOLOGY.

PLEXTOR®

(C7688) GST INC **$619**

*RENT: $7.33/WK

Plextor Portable For Notebooks & PC's 8/8/24 USB

It's the first-ever portable slim CD-R/RW drive from Plextor with 8 Speed writing and 8 Speed rewriting by full CLV technology with "BURN-Proof" and 24 speed reliable readying. The PX-88TU features USB 2.0 interface (maximum transfer rate of 480Mbps). The PX-88TU's unique see-through window enables easy identification of the disc inside the drive for both 12 and 8cm discs. All Plextor drives are supplied with:

- MVP 2000 Create a digital jukebox and customized play lists, Record audio CDs from the play list on CDR, Automated internet access to the CDDB database supplies album, song and artist information.
- Audio FS – allows for Drag & Drop access to any CD-Audio track as if they were .WAV files.
- Audio Capture 2000 - Drag & Drop tracks from standard audio CDs
- Plextor Manager 2000 utility software
- Disc Dupe 2000 – Duplicate your own CDs

(D0372) GST INC **$799** *RENT: $8.75/WK

Wine on-line? VINTAGE CELLARS vintagecellars.com.au

How to put up to 254 CD's into 1 convenient central 5 bay CD tower

The market leading CD tower offers fast and simple sharing of CD (and DVDs) on your network. New caching technology enables you to quickly store 100's of CD's onto a built-in fast hard disk within the tower. With the new optional CD-R/RW feature, the CD tower can also feature 'writing to CD' across the network.

- Axis technology at the heart of the CD Tower
- NEW optional CD-R/RW function enables you to burn to CD across the network
- True plug n play NAS device - The Optistor CD tower can be plugged in anywhere
- In built web server for easy web browser management

Advanced CD caching technology!

(B6595) GST INC FROM **$2,599** OPTISTOR®

*RENT: $25.49/WK

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Delivery Australia-Wide

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The figures quoted are based on a per week basis over 3 years. T.A.P, Terms & Conditions apply.

hp designjet 50ps, 20ps & 10ps

Affordable and productive

RES: up to 2400x1200dpi
SPEED: A3+ print outs can generated at a super fast speed of up to 4 mpp
INK: 6 -ink modular cartridge systems with four 69ml (cmyk) and two 28ml catridges that help minimize printer down time and reduce cost per print
RIP: stand alone or server based RIP optimises your system's resources
PAPER: up to A3

Pre-press proofing solution

HOT NEW PRODUCT

	Rent*	Part #	GST Inc:
hp designjet 50ps Professional solution A3+ graphics colour thermal injetprinter	$62.98	(C8933)	$7,259
hp designjet 20ps Work group solution A3+ graphics colour thermal injetprinter	$36.43	(C8932)	$3,898
hp designjet 10ps Personal Solution A3+ graphics colour thermal injetprinter	$26.46	(C8931)	$2,698

Web Direct

See Web Direct Link (at top of page) for all your HP ink & paper needs!

hp designjet 800

Professional graphics printer for 24" wide photo quality ads and graphics.

RES: 2400x1200dpi
SPEED: Prints times as short as 60 seconds (D size prints)
MEDIA: Coated & glossy paper,technical media. Sheet & roll feed, auto cutter
SIZES: Sheet: 610mm- 1897mm ; Roll: 24" (w) x 45.7m (l)
I/FACE: Parallel, USB
SIZE: Printer in 2 sizes 42 or 24 Inches wide

	Rent*	Part #	GST Inc:
hp designjet 800 24"	$82.69	(B8514)	$9,685
hp designjet 800PS 24"	$114.40	(B8518)	$13,965
hp designjet 800 42"	$93.51	(B8513)	$11,415
hp designjet 800PS 42"	$131.93	(B8519)	$16,105

hp designjet 5000

Professional graphics printer photo quality unmatched by any other printer

Come in & see one on display @ our Nth Ryde Location!

RES: 1200x600dpi on glossy media (6 colours:CMYKcm)
SPEED: max: 46.4 sq m/hr, at max quality 8.27 sq m/hr, at productivity 6.32 sq m/hr
MEDIA: Coated & glossy paper, backlit, opaque, vinyl, canvas...
SIZES: Sheet: 211mm- 914mm (w) x 559- 1600mm (l); Roll: 24/36/42" (w), up to 91.4m (l)
I/FACE: Parallel, hp JetDirect 610N 10/100 Base TX Print Server
SIZE: 2.0 x 0.69 x 1.3m: 100kg

	Rent*	Part #	GST Inc:
hp designjet 5000 42"	$158.38	(B6514)	$19,610
hp designjet 5000PS 42"	$208.02	(B9792)	$25,755
hp designjet 5000 60"	$252.61	(B6515)	$31,275
hp designjet 5000PS 60"	-	(B9791)	$38,580

FREE PRINT SAMPLE!! GO TO www.ht.com.au

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Web Direct www.ht.com.au/cat/hp

LaserJet printers

hp LaserJet1000 Series

HOT NEW PRODUCT

Designed for personal printing in entrepreneurial business,home business and telecommuters who challenged by multitude of printing needs, the hp Laserjet 1000 printer is a simple, low-cost, reliable laser printer for fundamental printing, delivering professional looking bussiness documents every time.

• 10 ppm • hp exclusive instant-on fuser eliminates warm-up time; first page out in 15 seconds • USB port • 48 MHz RISC processor • 7,000 pages per-month duty cycle • 1 MB RAM memory, 32KB ROM memory.

hp LaserJet 1000 (C9361) GST INC **$648**

hp LaserJet 1200 Series

hp LaserJet 1200 (base unit) (B9799) GST INC **$785**

hp LaserJet 1200n-16MB (B9958) GST INC **$1,295**

• 14 ppm A4 (best-in-class) and first page out in less than 10 seconds •increased memory of 8MB of RAM (upgradable to 72 MB) •protected 250-sheet input tray and 10-sheet priority feed tray•improved 10,000 pages monthly duty cycle •instant-on-fuser eliminates warm up time.

hpLaserJet 1220 (B9968) GST INC **$925**

You can now enjoy the comfort of printing, colour scanning and copying from one machine with the copier/scanner attachment for your hp LaserJet 1200. Beside enjoying all the best-in-class printing capabilities of the hp LaserJet 1200, you can now take control of your document management with the added benefit of colour scanning and copying.

hp LaserJet 4550 Series

hp colour LaserJet 4550 A4 16PPM 64Mb (B2381) GST INC **$3,944**

hp colour LaserJet 4550N A4 16PPM 64Mb 10/100 (B2382) GST INC **$4,469**

hp LaserJet 2200 Series

HOT NEW PRODUCT

• Improved productivity with faster printing at 18 ppm A4 • best printing resolution of true 1200 x 1200dpi at full speed •quicker return to application with 133 MHz processor • first page out in 15 seconds with instant on-fuser • print large and complex documents quickly and easily with 8 MB of standard memory (16 MB memory on hp LaserJet 2200dtn) – expandable up to 72 MB •increased duty cycle to 40,000/month. • LJ2200 model (no duplexer built in for double sided printing)

hp LaserJet 2200 (base unit) (A3361) GST INC **$1,059**

hp LaserJet 2200d (base unit) (B9956) GST INC **$1,537**

hp LaserJet 2200dn (B9957) GST INC **$2,039**

hp LaserJet 2200dtn (B9898) GST INC **$2,585**

hp LaserJet 4100 Printer

• Super fast printing at 24ppm A4 print • 250MHz processor ensures quicker return to application • complex documents print faster with 16MB/32MB memory • 12 second first page out • HP Pro-Res & FastRes 1200 dpi print quality at full speed • dynamic RIP-once for faster processing of multiple original prints • duty cycle of 150,000 pages/month

hp LaserJet 4100 (base unit) (B8399) GST INC **$2,209**

hp LaserJet 4100n (B8400) GST INC **$2,979**

hp LaserJet 4100tn (B8401) GST INC **$3,459**

hp LaserJet 4100dtn (B8402) GST INC **$3,990**

Trade-in your old printer upgrade to a new hp LaserJet now!

GO TO www.asiapac.hp.com/tradein/au/ to find full details & conditions.

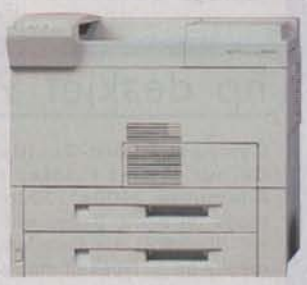
hp LaserJet 3200 Series

Printer, Fax, Copier & Scanner! An ideal business solution for small office, home office (SOHO), small/medium business and top level executives, the hp LaserJet 3200 series is four machines in one. Print, fax copy and scan from one machine and it only occupies 1.6 sq. ft. of your desk space!

hp LaserJet 3200 (C2332) GST INC **$1,499**

hp LaserJet 3200M (C4456) GST INC **$1,699**

hp LaserJet 8150 Series



The new HP LaserJet 8150 series is designed to grow with your business and its needs. It delivers high-volume, high-speed black and white prints and copies for small workgroups to large departments. • Fast printing at A4: 32 ppm; 32 MB RAM (expandable to 160 MB); 250MHz processor.

hp LaserJet 8150 (B1981) GST INC **$4,369**

hp LaserJet 8150N (B1986) GST INC **$4,995**

hp LaserJet 8150DN (B1982) GST INC **$5,660**

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hp officejets & deskjets

hp officejet T65

All In One Scanner/Printer/Fax/Copier

• Up to 11ppm mono and 8.5ppm colour •75 page memory •Colour fax capability • 100 speed dials with 10 one-touch keys • junk fax barrier, 20 group speed dials fax forwarding • Colour scanning - 300 x 600dpi optical, up to 1200dpi enhanced 24 bit colour • walk-up colour copy.

(84893) GST INC **$439**

hp PSC 750

HOT NEW PRODUCT

Printer-scanner-copier

Ideal for: Busy families that need convenience and quality Savvy users with limited work space Students who want to get creative with cards, newsletters and more benefits: Make quick color copies at home from 3x5 inches up to 8.5 x 14 inches Scan your favorite snapshot to e-mail friends and family Print on photo paper to put in your photo album

(C7655) GST INC **$705**

hp officejet K80

Ideal for: Photographers needing photo-quality prints on any paper Small offices looking to share faxing, copying, and printing responsibilities Office managers looking for a compact, cost-effective office solution

Features • color speed 10 ppm colour • black speed 12 ppm black • print technology HP Photo REt III technology (color layering technology) • scanner enhanced resolution 3600 dpi • scanner bit depth 36-bit A/D colour.

(B2081) GST INC **$785**

hp officejet G85

All Colour: Printer, Copier, Scanner & Fax

Prints at up to 12 ppm black, 10 ppm color using HP photoREt 3 Precision Technology, 2400 x 1200dpi colour, as well as flatbed 36-bit scanning, faster copying speeds, and upgradeable networking capability which allows one unit to be shared by several PCs. Each model combines a color printer, scanner, copier and a walk-up color fax.

(A0062) GST INC **$1,160**

hp deskjet 640c

When it's affordable versatility you need, look to the HP Deskjet 640C printer. • Print speeds up to 6 ppm in black and 3 ppm in color • Compatible with Windows 3.1x, 95, 98, NT 4.0, 2000, MS-DOS applications • Connect easily and quickly to your PC or USB-connect Mac • Add photo quality with optional cartridge

(A2288) GST INC **$144**

hp deskjet 990c

Best Photo-Quality plus Premier Business Printing

• Infrared printing from PDAs, notebook computers, and other mobile devices. • Up to 17 ppm in black, 13 ppm in color • Optical sensor detects paper type, then selects the ideal print mode •Automatic Duplex printing capability

(B1967) GST INC **$710**

hp deskjet 930c

Compact Photo-Quality Colour InkJet Printer • Alternative 2400x1200dpi mode on photo paper with HP PhotoREt 3 • Excellent results on all types of media in all modes • Prints up to 9ppm black and 7.5ppm colour.

(95761) GST INC **$258**

hp deskjet 1125c

The versatile wide-format colour printer for business and home use • Fast printing with up to 7ppm black and 5.5ppm colour • USB Interface for plug-and-play of peripheral devices • Network upgradable • Up to 3000 pages/month duty cycle for robust printing • A3 printing capability.

(C9616) GST INC **$559**

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hp scanjets & consumables

hp scanjet 4400

HOT NEW PRODUCT

hp's exclusive scanning software automatically optimises scanned photos, converts *black-and-white line art* into infinitely scalable vector files and automatically creates editable text from scanned documents with a simple drag-and-drop, copy and paste or scan to. If you want the flexibility to adjust scanned images on your own, you can do that,too.

FLY BUYS 500 BONUS POINTS

(C5904) GST INC **$265**

hp scanjet 5470c

HOT NEW PRODUCT

Superior scans at a touch High-perfor- mance,2400 dpi scanner for professional use. Image resolution up to 2400 dpi with true 48-bit colour •hp 's exclusive dual sensor CCD (charge coupled device) technology brings you exceptional crisp and sharp scans up to 2400 dpi resolution •true 48-bit colour depth delivers true-to- original, colour-rich images •no compromise on speed with preview scans in as little as 8 seconds

FLY BUYS 500 BONUS POINTS

(C7652) GST INC **$529**

FLY BUYS 500 BONUS POINTS

Collect 500Bonus Fly Buys points when you purchase C5904,C7652, C5896, C7201, B9949 or C1561 between 20/10/01 - 30/11/01

colour scanners	scan speed	image quality	scanning software	Part No	Price
hp scanjet 2200	18 seconds	600 dpi optical	precisionscan LTX	(C5896)	GST INC **$169**
hp scanjet 5400	08 seconds	2400 dpi optical	precisionscan pro 3.0	(C7201)	GST INC **$395**
hp scanjet 7400	04 seconds	2400 dpi optical	precisionscan pro 3.0	(B9949)	GST INC **$979**
hp scanjet 7450	04 seconds	2400 dpi optical	precisionscan pro 3.0	(C1561)	GST INC **$1,429**

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toner

hp C4193A HP 4500 Magenta Toner Cartridge 6000 page (70440) GST INC **$257**

hp C4192A HP 4500 Cyan Toner Cartridge 6000 page (70439) GST INC **$257**

hp C4182X HP LaserJet 8100 Series 20,000 Page Toner (70461) GST INC **$385**

hp C4127X HP LaserJet 4000 Series 10,000 Page Toner (54731) GST INC **$259**

hp C4096A HP LaserJet 2100/2200 Series 5,000 Page Toner (73192) GST INC **$210**

paper

hp 10x15cm Premium Plus Photo Paper Glossy - 20 Sheets (84905) GST INC **$19**

hp A4 Premium Plus Photo Paper Glossy - 20 Sheets (84904) GST INC **$29**

hp A4 Premium Photo Paper - 15 sheets (54010) GST INC **$19**

hp A3 Premium Photo Paper Size -20 Sheets (58635) GST INC **$59**

hp Iron On T-shirt Transfers A4 10 pages (52818) GST INC **$26**

hp HeavyWeight InkJet (European A4, 100 sheets) (54009) GST INC **$29**

ink cartridges

No 29 Black injet Cartridge (21919) GST INC **$69**

No 78 Tri-Colour Inkjet print Cartridge (86183) GST INC **$79**

No 20 Black print Cartridge (A3302) GST INC **$59**

No10 Black Ink Cartridge Designjet 500 (70165) GST INC **$79**

No 45 Black injet Cartridge (22643) GST INC **$69**

No10 Magenta Ink Cartridge (70167) GST INC **$79**

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Exceptional Value Printers & Scanners

SENSATIONAL $600 BUBBLEJET PRINTER

(C4013) GST INC **$499**

FLY BUYS 500 BONUS POINTS

- 8" x 10" photo in approx. 90 seconds
- Four individual ink tanks with low-ink sensor
- 2400 x 1200 dpi in color (38% greater than 2880 x 720 dpi)
- Advanced MicroFine Droplet Technology™ for photo-image quality
- Compatibility: Windows® 95/98/2000, Windows NT® 4.0, Windows Me

I can...

You can...

Canon

UP TO 15 PPM BLACK / 10 PPM COLOUR!

FLY BUYS 500 BONUS POINTS

Collect 500 Bonus Fly Buys points when you purchase C4013 between 20/10/01 - 30/11/01

PowerShot A10 DIGITAL CAMERA

(C3968) GST INC **$685**

PowerShot A20 DIGITAL CAMERA

(C3864) GST INC **$874**

PowerShot DIGITAL IXUS-V

(C5389) GST INC **$1,174**

PowerShot DIGITAL IXUS 300

(C5653) GST INC **$1,295**

PRINTERS

360x720dpi
(A1792) GST INC
$105

BJC-1000SP Bubble Jet Printer
- Outstanding operating economy.
- Vivid colours, even on plain paper.
- Exceptional photographic quality.
- Automatic image improvement.
- Banner printing and outstanding versatility.

360x720dpi
(A3173) GST INC
$145

BJC-2100SP Bubble Jet Printer
- New Super Economy mode cuts operating costs by up to 75%.
- High speed printing, up to 5 ppm black text and up to 2 ppm colour.
- Optional colour scanner.
- Now with parallel port.

1440 X 720dpi
(B9834) GST INC
$219

S400SP Bubble Jet Printer
- Super-high resolution, up to 1440 x 720 dpi.
- Brilliant colour inks.
- Operating economy.
- Extraordinary photo printing.
- Optional colour scanner cartridge IS-32.

1440x720dpi
(B9838) GST INC
$625

S4500 Bubble Jet Printer
- Print speeds up to 9 ppm in black text & up to 6 ppm in colour text & graphics
- Print **A3**, new brilliant inks.
- Separate ink tanks for each colour.
- Parallel connectivity for Windows 95/98/2000/ME.
- Optional IS-32 scanner cartridge.

1200x2400dpi.
(B9836) GST INC
$558

S800 Bubble Jet Printer
- Photo Lab printing for the desktop.
- Printing resolutions up to 2400 x 1200 dpi.
- Separate ink tanks for each colour.
- Includes Photo Optimiser Pro and Photo Record image browser software.

600x600dpi.
(C3917) GST INC
$498

LBP810 Printer
- High resolution 600 dpi printing for crisp text and graphics.
- 8 ppm engine speed.
- Wide media compatibility, print transparencies, envelopes, postcards etc.
- Outstanding line definition - equivalent to 2400 dpi horizontally.
- Parallel & USB connections for wide compatibility.

SCANNERS

300x600dpi
(A8919) GST INC
$109

N340P Flatbed Scanner
- Optical resolution is 300 by 600 dpi with selectable resolution up to 2400 dpi.
- 14 Bit colour input.
- ScanGear Toolbox for easy copy, fax and e-mail operations.
- Simple parallel connection for wide compatibility.

600x1200dpi
(A7655) GST INC
$137

N640P Flatbed Scanner
- Optical resolution is 600 by 1200 dpi with selectable resolution up to 9600 dpi.
- Revolutionary 39 mm thick design.
- ScanGear Toolbox for easy copy, fax and e-mail operations.
- LIDE Technology for distortion free scanning.

600 x 1200 dpi.
(D1005) GST INC
$189

N670U Flatbed Scanner New
- One touch scan controls
- USB Interface
- 600 x 1200 dpi
- Multi-photo mode that lets you scan up to ten photos at once.
- Advanced Z-Lid cover simplifies scanning of bulky items, books and magazines.

1200x2400dpi.
(C7589) GST INC
$289

N1240U Flatbed Scanner New
- Amazing 1200 x 2400dpi optical with selectable resolution up to 9600dpi.
- Stylish charcoal and aluminium finish.
- New Z-lid for scanning thick books etc.
- Software for Windows & Mac including OmniPage and PhotoShop Elements.

1200x2400dpi.
(B9935) GST INC
$389

CanoScan D1230U Flatbed Scanner
- A4 1200x2400dpi flatbed scanner - optional 1200x2400dpi film scanning.
- Fast one pass USB scanning.
- Stylish charcoal grey and aluminium design.
- Includes Adobe PhotoShop 5.0LE & OmniPage OCR software for Win. and Mac.

2400x4800dpi.
(B9840) GST INC
$758

CanoScan D2400U Flatbed Scanner
- Optical resolution of 2400 x 4800 dpi.
- Film adaptor lid - for accurate scanning of 35mm, 2¼" and 4"x5" film.
- Outstanding colour accuracy.
- Ideal for professional studios, graphics and design bureaus.

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The Power to Create

PRINTER

EPSON STYLUS C20UX

BONUS USB CABLE (in box) while stocks last!

The Easy-To-Use Home Colour Printer that gives photo quality printing, and delivers best-in-class for overall cost effectiveness. **KEY FEATURES** • Up to 720 x 720 dpi photo quality printing •Fast, easy set-up and operation • USB equipped for simple plug and play printing • Up to 6.5 ppm black text printing

(C5572) GST Inc: **$128**

PRINTER

EPSON STYLUS C40SX/C40UX

The Easy to use Quality Home Colour Printer with up to 1440 dpi. **KEY FEATURES** • Up to 1440 x 720 dpi photo Quality printing. • Fast, easy set-up and operation of both models. • Choice of USB or Parallel models, simple plug and play printing. • 8ppm black text speed and 3.9 ppm colour text speed.

C40SX (Parallel) (C5574) GST INC **$169**

C40UX (USB) (C5573) GST INC **$169**

LASER PRINTER

EPSON AL-C2000

EPSON technologies, including AcuLaser Multiple-screen Printing, Colour RIT and Colour Stabilizing. In addition, AcuLaser Colour Halftoning provides print resolution equivalent to 2,400 dpi (defined print resolution: 600dpi). Text is extremely sharp and photos have excellent contrast.

(A7365) GST Inc: **$4,579**

PRINTER

EPSON STYLUS PHOTO810

• On-demand Inkjet (piezoelectric) • 48 x 6 nozzles •Black text (memo) A4 Approx. 12ppm (Economy) • full page colour A4 Approx. 1.4ppm (Normal)* • USB compatible • Colour: Cyan, Magenta, Yellow, Light Cyan, Light Magenta • DRIVERS Microsoft® Windows® 95/98/2000/Me/NT® 4.0.

(C9372) GST Inc: **$375**

PRINTER

NEW

EPSON STYLUS C60

• 2880 x 720 dpi resolution • Fast 12ppm* for both Black and Colour Text Memo (*at economy mode) • Precise-Super fine detailed printing with up to 2880 dpi, MicroPiezo Print Head and 4pl Variable Sized Droplet Technology • Four-colour ink system.

(D0042) GST Inc: **$285**

PRINTER

NEW

EPSON STYLUS C80

• Up to 20 ppm* for black text • Constant monitoring of ink consumption with the Intellidge™ ink system in each of the four ink cartridges • Pigment inks for prints that are fade-, water- and smudge-resistant • Super fine printing with up to 2880 dpi.

(D1665) GST Inc: **$620**

PRINTER

affordable 6-colour printer

EPSON STYLUS PHOTO895

Outstanding Photographic 6-Colour Quality with Personal Digital Photo Lab Function. • Up to 2880 x 720 dpi photo • Quality printing resolution • PRINT Image Matching™ enabled • USB interface for plug-and-play • Over 20 years lightfastness***

(C9632) GST INC **$729**

PRINTER

EPSON STYLUS COLOR1160

• Printing method - On-demand inkjet (piezoelectric) • Nozzle configuration - 144 nozzles (Black), 48 x 3 nozzles (Cyan, Magenta, Yellow) • Print direction - Bi-directional with logic seeking • Resolution - 1440 x 720 dpi • A3 Compatible.

(87723) GST INC **$599**

SCANNER

EPSON PERFECTION 1250

This new EPSON scanner features resolution and scanning technologies which sets it apart from other scanners in its price class. • 1200 x 2400 dpi optical resolution •48-bit colour depth (internal) • USB interface for plug-and play

(C9439) GST Inc: **$229**

SCANNER

EPSON PERFECTION 1650

Perfection 1650 series offers full auto scanning mode for documents and photos, and the Perfection 1650 Photo, in addition, feature auto batch scanning mode for film and slides. using its film adapter. Scanning • 1600 x 3200 dpi optical resolution • USB interface for plug-and-play

(C9387) GST Inc: **$373**

SCANNER

EPSON EXPRESSION 1640XL

The Expression 1640XL A3+ scanner features EPSON's most advanced scanning technologies providing high speed, maximum detail and superior sharpness and clarity.

(B1330) GST Inc: **$5,643**

LASER PRINTER

EPSON EPL 5800

The EPL-5800 Laser Printer is an excellent solution for small work groups, offering best-in-class features at a very attractive price: • True 1200 dpi • Fast 10ppm print mode • 16MB •Network ready •optional 10/100 BaseT Network Card • Optional Adobe Postscript 3 for high quality imaging and performance.

(A0812) GST Inc: **$658**

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EXTENDED HARRIS TECHNOLOGY WARRANTY

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SWANN SPEED DEMON (87970) GST INC **$95**
56K V.90 External Voice/Fax/Data Modem NEW

- New graphite version!
- Great value for money
- Bonus Telstra "100 hours" Internet Access CD
- Drivers and application CD included
- 1 year "Hassle Free" warranty Swann Code: SW-M-SDE

SWANNSMART TURBO (B1846) GST INC **$125**
56K V.90 External Voice/Fax/Data Modem

- Intel® Modem chipset
- Crystal clear hands free voice transfer
- Includes Web Works Internet Toolkit CD ROM
- 30 day Swann Satisfaction Guarantee
- 5 years "Hassle Free" warranty
  Swann Code: SW-M-SSTE

SWANN MICROCAM (C5312) **$599**
2.4GHz Wireless Ultra Miniature Camera System

- The ideal discreet security system
- Simple to install, just plug to any video device such as a VCR, TV or security monitor and play
- Superior quality CMOS colou lens up to 100m transmission range
- 1 year "Hassle Free" warranty Swann Code: SW-P-MC

SWANN FIREWIRE™ PRO DV KIT (A1794) GST INC **$189**
Everything you need for easy and fun digital video editing

- Captures full screen video from your camera to your computer's hard drive with transfer speeds of up to 400Mbps
- Complete kit with FireWire PCI Card, comprehensive software, bonus headset and FireWire 6pin-4pin cable
- 1 year "Hassle Free" warranty Swann Code: SW-F-FWVWP

SWANN USB MULTI-HUB USB 4-Port Hub

- Easy and convenient access to USB ports – no need to open your computer to install an adaptor card
- Supports bus-powered and self-powered USB peripherals (including printers, scanners, modems, keyboards and mice)
- Allows "Hot Swapping"
- PC & Mac compatible
- 1 year "Hassle Free" warranty Swann Code: SW-U-4PMH

(C6793) GST INC **$55**

SWANN USB SMARTCAM DELUXE USB Web Cam

- Easy installation. Just plug and play!
- 640 x 480 VGA resolution
- Up to 30 frames per second
- PC & Mac compatible
- 1 year "Hassle Free" warranty
  Swann Code: SW-U-SCDELP (Web Cam case colour may vary)

(C6794) GST INC **$69**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery#
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- Explosive Windows desktop acceleration
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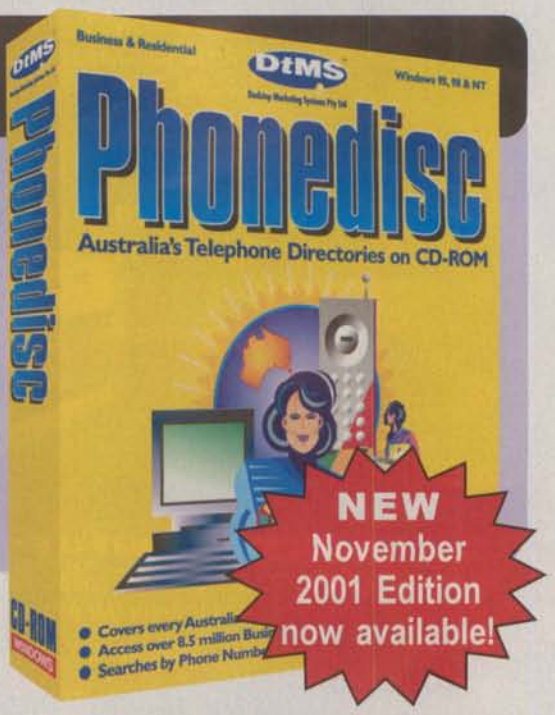

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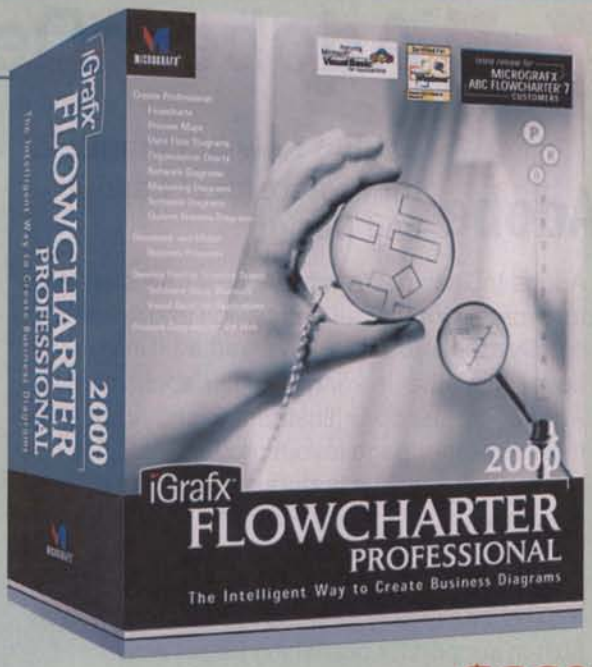

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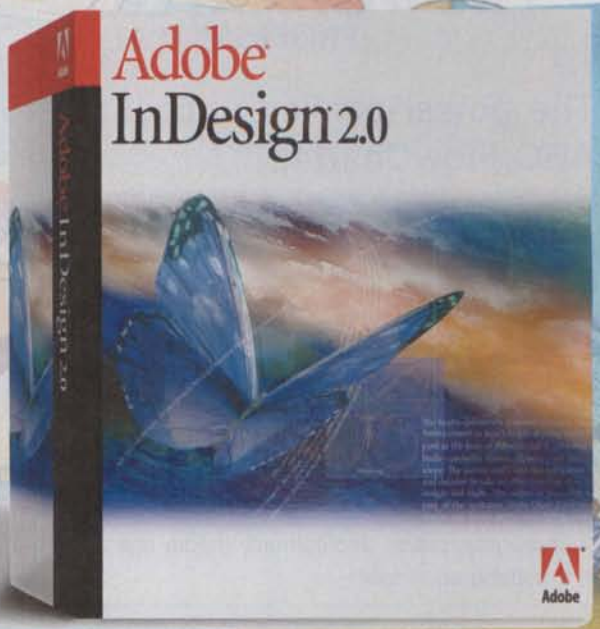

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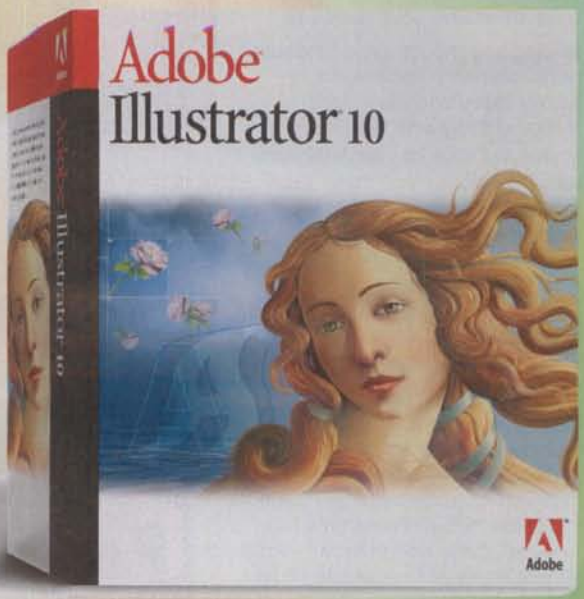

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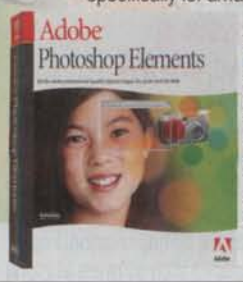

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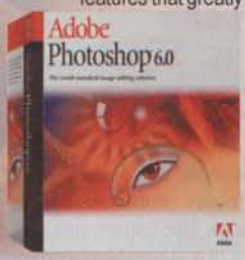

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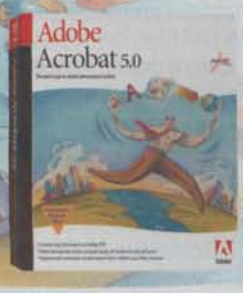

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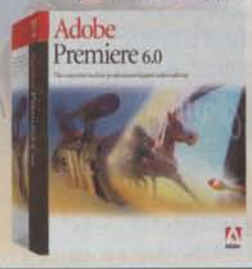

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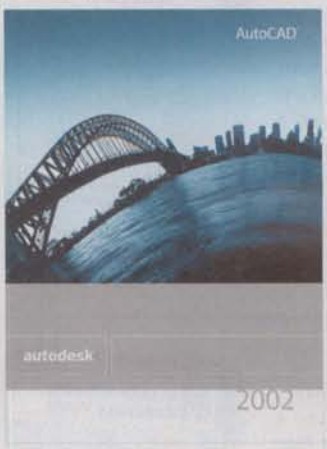

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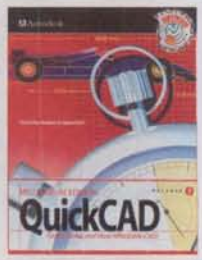

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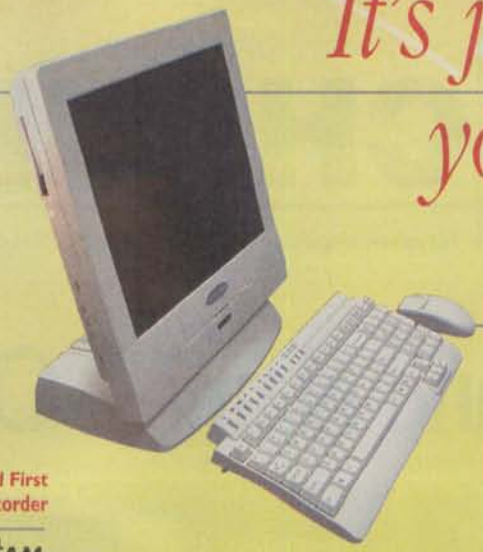

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A3CF	A3 Clear Film 100mu	50	$ 71.00	1.42
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CANON BJ-300/ 330	7	4-BKL
CANON BJC-600/610/620	16	5-BKL
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21	45	19-BKL
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BC-20	9	18-BKL
CANON BJC-3000/6000/8000 Series	12	46-BKL
HP Desk Jet 400/500 Series	6	8A-BKL
HP Desk Jet 600/660/690 Series	6	8B-BKL
HP Desk Jet 700/800/900/1000 Series	8	29-BKL
HP Desk Jet 300 Series & Olivetti JP's!	8	7-BKL
EPSON Stylus 400/800/800+/1000	8	1-BKL
EPSON Stylus Colour /PRO/XL	12	2-BKL
EPSON Stylus 820/colour II/IIs	12	23-BKL
EPSON Stylus Colour 200/300/400/500/600/800/850/1520	12	33A-BKL
EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	12	33B-BKL
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Intel Pentium III-1000/133 (S370)	$474
Intel Pentium 4-1.4GHz	$333
Intel Pentium 4-1.5GHz	$370
Intel Pentium 4-1.7GHz	$474
Intel Pentium 4-1.9GHz	$881
Intel Pentium 4-2.0GHz	$1,308
AMD Duron 850 (oem) (Socket A)	$117
AMD Duron 900 (oem) (Socket A)	$145
AMD Duron 950 (oem) (Socket A)	$162
AMD Athlon K7- 900T 3D (oem) (Socket A)	$217
AMD Athlon K7- 1000T 3D (oem) (Socket A) (B Version)	$226
AMD Athlon K7- 1000T 3D (oem) (Soc A, 266Mhz)(C Ver)	$212
AMD Athlon K7- 1100T 3D (oem) (Socket A)	$219
AMD Athlon K7- 1200T 3D (200Mhz) (oem) (Skt A) (B Ver)	$239
AMD Athlon K7- 1200T 3D (266Mhz) (Socket A) (C Ver)	$239
AMD Athlon K7- 1300T 3D (200Mhz) (oem) (Socket A)	$264
AMD Athlon K7- 1330T 3D (266Mhz) (oem) (Socket A)	$258
AMD Athlon K7- 1400T 3D (266Mhz) (oem) (Socket A)	$274

MOTHERBOARDS

Abit VP6 (VIA, S370, U-100, RAID)	$337
Abit KT7A (VIA, Soc-A)	$257
Abit KT7A-RAID (VIA, Soc-A, U-100 RAID)	$314
AOpen MX34 (VIA, S370, Audio, M-ATX, 133)	$189
AOpen MX3S (815, S370, M-ATX, All-in-One)	$286
AOpen AX3S (815, S370, VGA, Audio, U-100)	$261
AOpen AK33 (VIA, Soc-A, Audio, AGP 4x)	$222
AOpen MK33 (VIA, Soc-A, M-ATX, Audio, AGP 4x)	$178
AOpen AK73 (KT-133A, Soc-A, ATA100)	$251
Asus P4B with 1.5 G P4	$726
Asus CUSI-M (SiS, S370, M-ATX, VGA, LAN, Audio)	$182
Asus CUSL2 (815, S370, U-100, VGA, AGP Pro 4x)	$333
Asus CUSL2-C (815, S370, U-100, AGP Pro 4x)	$234
Asus CUV-4XE (VIA, S370, AGP Pro 4x, 133)	$219
Asus CUV-4XDLS	$754
Asus CUV-4XD (VIA, S370, AGP Pro 4x, 133)	$390
Asus A7V-E-A (VIA, Soc-A, U-100, Audio)	$219
Asus A7V/133 (VIA, Soc-A, U-100) (Raid)	$318
Asus A7V133-C (VIA, Soc-A, U100, No Raid)	$260
Asus A7V/266 (Soc-A, U-100, AGP Pro 4x)	$358
Asus A7A/266 (Soc-A, U-100, AGP Pro 4x)	$346
Asus A7M/266 (VIA, Soc-A, U-100)	$401
Asus P4T (with Free 256 RDRam)	$636
Asus P4T-M (815, U-100, AGP Pro 4x)	$338
Intel BOXD850GB Garibaldi Board for Pentium 4	$343
Gigabyte GA-6VXDC7 (VIA, Dual S370)	$241
Gigabyte GA-6VXC7-4X-P (VIA, S370, AGP 4x, U100)	$158
Gigabyte GA-8TXC (850 FSB450 5PCI AC97	$403
Gigabyte GA-8TM (850 FSB400 ATA100 2PCI)	$383
Gigabyte GA-7ZXR (VIA Soc-A ATA100 Audio)	$277
Gigabyte GA-7ZMM (VIA, Soc-A ,ATX, Audio)	$191
Gigabyte 8TX (PGA 423 socket, RDRAM, ATX)	$396
MSI 850 Pro (850, SKT-423, U-100, Audio) #6339	$380
MSI 6330 Ultra3 (KT133, SKT-A, U-100, Audio)LE-3	$223
MSI 6368 (PLE-133,SKT-370,VGA,Audio,U-100,LAN)wlan	$174
MSI 6378 (KLE-133, SKT-A, VGA, Audio, U-100)w/olan	$185
MSI K7T266 PRO R (PRO-266, SKT-A, U-100, Raid)	$350
MSI K7T266 PRO (PRO-266, SKT-A, U-100) #6380	$323
MSI K7Master (AMD760SP, SKT-A, Audio, U-100)	$350

MEMORY

128MB PC133 SDRAM 168pin (HY/MT)	$39
256MB PC133 SDRAM 168pin (HY/MT)	$71
512MB PC133 SDRAM 168pin (HY/MT)	$173
64MB PC133 SDRAM 168pin (oem)	$25
*128MB PC133 SDRAM 168pin (oem)	$35
256MB PC133 SDRAM 168pin (oem)	$68
512MB PC133 SDRAM 168pin (oem)	$170
128MB SDRAM PC150 168pin (oem)	$124
256MB SDRAM PC150 168pin (oem)	$254
128MB PC133 SDRAM ECC 168pin	$124
256MB PC133 SDRAM ECC 168pin	$220
512MB PC133 SDRAM ECC 168pin	$523
64MB Rambus RDRAM RIMM 800Mhz ECC	$56
128MB Rambus RDRAM RIMM 800Mhz ECC	$127
256MB Rambus RDRAM RIMM 800Mhz ECC	$254

HARD DISKS - IDE

20Gb Seagate Barracuda 2M 7200	$219
30Gb Seagate Barracuda 2M 7200	$238
40Gb Seagate u-100 5400	$244
40Gb 75GXP IBM Deskstar U-100 2M 7200	$299
60Gb 75GXP IBM Deskstar U-100 2M 7200	$430
75Gb 75GXP IBM Deskstar U-100 2M 7200	$605
20Gb Quantum FB AS U-100 2M 7200	$207
30Gb Quantum FB AS U-100 2M 7200	$246
40Gb Quantum FB AS U-100 2M 7200	$271
60Gb Quantum FB AS U-100 2M 7200	$396
20Gb WD Caviar/Maxtor U-100 5400	$197
30 Gb WD Caviar U-100 5400	$215
40 Gb WD Caviar U-100 5400	$235
*20Gb WD Caviar U-100 7200	$215
30Gb WD Caviar U-100 7200	$251
40Gb WD Caviar U-100 7200	$284

HARD DISKS - NOTEBOOK

12GB Hitachi 9.5mm	$346
10Gb 20GN IBM Travelstar U-66 9.5mm	$245
20Gb 20GN IBM Travelstar U-66 12.5mm	$352
30Gb 30GT IBM Travelstar U-66 12.5mm	$644

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9.1Gb Fujitsu U-160 7200rpm MC	$362
18.2Gb Fujitsu U-160 10000rpm	$508
36.2Gb Fujitsu U-160 10000rpm	$978
9Gb Quantum Atlas V U-160 LVD68	$343
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9Gb Quantum Atlas 10K II U-160 LVD68	$392
18Gb Quantum Atlas 10K II U-160 LVD68	$632
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9.2Gb Seagate Cheetah LVD68 10,000rpm	$469
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36.7Gb Seagate Cheetah LVD68 10,000rpm	$972
18Gb Seagate Cheetah LVD68 15,000rpm	$746
18Gb IBM Ultrastar 36LZX U-160 10k LVD68	$476

FDD & STORAGE DEVICES

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Iomega 100M Zip Int. IDE (oem)	$103
Iomega 100M Zip Ext. Parallel	$268
Iomega 100M Zip Ext. USB	$198
Iomega 100M ZIP Media	$25
Iomega 250M Zip Int. IDE (oem)	$187
Iomega 250M Zip Ext. Parallel	$367
Iomega 250M Zip Ext. USB	$403
Iomega 250M Zip Ext. USB&PCMCIA	$431
Iomega 250M ZIP Media	$31
ORB 2.2GB Int. IDE Drive (retail)	$331
*ORB 2.2GB Int. IDE Drive (oem)	$370
ORB 2.2GB Int.SCSI Drive (oem)	$312
ORB 2.2GB Ext.SCSI Drive (retail)	$400
*ORB 2.2GB Ext. USB Drive (retail)	$502
ORB 2.2GB Disk Media	$72
ORB 5.7GB Int. IDE Drive	$772
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ORB 5.7GB Disk Media	$103

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32M TNT2 M64 AGP w/ TV Out	$110
32M TNT2 M64 PCI (Retail)	$107
32M TNT2 M64 PCI w/ TV Out	$150
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Pixelview GeForce 3, 64m DDR TV out	$892
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32M Creative Blaster GeForce PRO DDR	$314
*32M Creative Blaster GeForce II GTS	$414
64M Creative Blaster GeForce II Ultra	$484
32M Leadtek Winfast Geforce II MX 200 (oem)	$123
32M Leadtek Winfast GeForce II MX Pro Dual Head TV	$301
32M Leadtek Winfast GeForce II GTS TV AGP	$464
64M Leadtek Winfast GeForce MX-400/TV	$198
64M Leadtek Winfast GeForce II GTS TV Pro (Retail)	$370
64M Leadtek Winfast GeForce II GTS TV Ultra	$872
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32M Millenium G400 Dual Head MAX (retail)	$508
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Appian Hurricane, PCI, 32MB dual port	$604
ELSA Synergy 2000, 32MB AGP, Quadro2 EX	$532
ELSA Gladiac 920, 64MB AGP, GeForce3	$978
32MB Hercules 3D Prophet DDR-DVI (TV+Flat Panel)	$401
64MB Hercules 3D Ultra (with TV out + DVI out)	$909
32MB 3D Prophet 4000 XT PCI 128bits	$212
32MB 3D Prophet 4000 XT AGP 128bits (OEM)	$119
32MB 3D Prophet 4000 XT AGP 128bits with TV Out	$225
64MB 3D Prophet 4500 XT PCI	$370
64MB 3D Prophet II GTS	$677
64MB 3D Prophet 4500 XT AGP with TV Out	$408
3D Prophet III NV 20 (TV Out & DVI Out)	$912

MONITORS

LG 15" 552V	$251
NEC V520 Multisynch	$307
Mitsubishi D/view 1770G 17", .27	$364
Mitsubishi D/view 1786FG 17", .25	$499
Mitsubishi D/view 17NF 17", .25 (Flatron)	$639
Mitsubishi D/view 1995SL 19"	$698
Mitsubishi D/view 19NF 19", .25 (Flatron)	$1,041
Mitsubishi D/view 2107 21", .26 1600x1280	$1,549
*Acer 771 17", .27 1280x1024 60Hz	$384
Acer 99si 19", .26 1600x1200 75Hz	$755
Acer 211C 21", .26 1600x1200 75Hz	$1,663
*Hitachi CM615 17", .24 1280x1024	$376
Hitachi CM621 17" (Flat)	$445
Hitachi CM625 17" (Flat Diamondtron)	$477
*Hitachi CM715 19", .22 1600x1200	$633
*Hitachi CM721F 19", .20 1600x1200 (Flat)	$752
*Hitachi CM772 19", .22 1800x1350 (Flat)	$865
*Hitachi CM828 21", .21 2048 x 1536	$1,614
*Hitachi CM823F 21", .21 2048 x 1536	$1,768
LG SW775N Studioworks 17"	$366
LG 795FT Flatron 0.25 17"	$677
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*Sony E220 17", .24-.25 (Flat Trinitron)	$640
*Sony G420 19", .24-.25 (Flat Trinitron)	$1,234
*Sony G520 21", .24 (Flat Trinitron)	$2,069
Viewsonic PS775-2E 17", .26 1600x1200	$583
Viewsonic PF775 17", .25 1600x1200 Flat	$652
*Viewsonic E70-3 17", .27 1280x1024	$367
Viewsonic E790 19", .26 1600x1280	$825
Viewsonic PF790 19", .25 1600x1200	$941

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Hitachi CML152XW 15" TFT Monitor	$924
*Hitachi CML170SXW 17" TFT Monitor	$2,008
Viewsonic 18" LCD VP181 1600x1200	$6,074

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Deluxe Midi Tower ATX 300W (For Pentium 4)	$76
AOpen P4 Full Tower ATX HQ08 300w	$256
AOpen Midi Tower ATX KF45	$89
AOpen Desktop ATX HX95	$126
AOpen Full Tower ATX HX08	$206
Macase Midi Tower ATX KA-80 250W	$127
Macase Midi Tower ATX KA-80 300W	$139
Macase Midi Tower ATX KA-580WP 250W	$131
Macase Midi Tower ATX KA-580WP 300W	$142
Macase Desktop ATX (250W)	$127
Macase Full Tower ATX KA-C-80 FAN DUST 300W	$256
Macase Server Tower ATX KAO66 (1X300W)	$523
Macase Server Tower ATX KAO66 (1X400W)	$908
Macase KI-P20 4U Rackmount ATX Case 300W	$612
Macase KI-P32 4U Rackmount ATX Case 300W	$495
Macase 8-Bay Ext. SCSI -50 CDROM tower	$572

KEYBOARDS

Deluxe 104 - Keyboard PS/2	$15
Acer Accufeel Keyboard PS/2	$23
Logitech Internet Keyboard PS/2 (oem)	$53
Logitech Cordless iTouch	$128
Logitech iTouch Keyboard w/ 2 USB Ports	$114
Logitech C'less Keyboard + Mouse (oem)	$150
Logitech C'less Freedom Pro (K/b + Mouse)	$220
Microsoft Internet Keyboard PS/2 (oem)	$49
Microsoft Ergonomic Elite PS/2	$63
Microsoft Natural Keyboard Pro PS/2&USB	$124

MICE

A4+ 400dpi 2-Button Serial	$7
Browser Wheel Mouse PS/2	$15
Dual Scroll wheel mouse PS2	$74
Swann Mini Mouse (Blueberry) USB	$14
Logitech Wheel Mouse PS/2 (oem)	$42
Logitech Wheel Mouse USB (oem)	$42
Logitech Cordless Wheel Mouse PS/2 (oem)	$80
Logitech Cordless MouseMan Wheel PS/2	$108
Microsoft Trekker Mouse PS/2 (oem)	$17
Microsoft Intellimouse PS/2 (oem)	$44
Microsoft Intellimouse Optical USB&PS/2 (OEM)	$68
Microsoft Intellimouse Optical USB&PS/2 (Retail)	$80
Microsoft Intellimouse Explorer USB (oem)	$72

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Samsung / LG 52x CD-ROM Drive	$72
52x Creative IDE CD-ROM Drive	$70
50x Asus IDE CD-ROM Drive	$83
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Pioneer 16x DVD 40xR IDE Bare Drive (OEM) (#116)	$142
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Plextor 12x10x32 SCSI External	$799
Ricoh 7163A (16x10x32) IDE Kit	$227
Ricoh 7200A (20x10x40) IDE Kit	$300
Ricoh 8040S (4X4X20) SCSI Slim (Notebook)	$726
Creative (16x10x40)	$236
Sony 160S (12x8x32) SCSI Bare Drive (OEM)	$434
Sony 160E (12x8x32) IDE Bare Drive (OEM)	$249
Iomega Zip (12x10x32) Int IDE	$561
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Eagle 16 bit ESS 1938	$26
Sound Blaster Vibra 128 (oem)	$45
Sound Blaster PCI-128 2-Channel (oem)	$55
Sound Blaster LIVE (oem)	$111
*Sound Blaster LIVE DE 5.1	$131
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GUILLEMOT MAXI SOUNDMUSE (Retail)	$75
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180W PMPO Stereo Power	$15
*TS 297 3-P Subwoofer Premium Speakers	$45
PLC WS-80 720w Sub woofer	$39
Altec Lansing ACS22 - 2p	$45
*Altec Lansing ACS45.1 Power Cube - 3p	$163
Atec Lansing ATP3 Flatpanel -3p (multi-channel)	$200
Altec Lansing ACS56 Gamers -5p Digital In	$253
Altec Lansing ACS48 Power Cube + - 3p	$253
Altec Lansing ADA305 USB Dolby P/L Srnd	$193
Altec Lansing ADA880 Dolby AC3 - 5p	$488
Cambridge PCWorks 3-p	$78
Cambridge FPS1000 4-p Surround	$128
Cambridge FPS1500 4-p Surround Digital	$172
Cambridge FPS2000 4-p Surround Digital	$380
Cambridge DTT2200 5-p Speaker Bundle	$264
Cambridge DTT2500D 6-p Desktop Theater	$564
Cambridge DTT3500D 6-p Desktop Theater	$792
Yamaha YST-MS201 Digital Surround Speakers	$119
Yamaha YST/M100 Surround Speakers	$210
Yamaha YST/MS55 Sub + Speakers USB	$276
Yamaha YST/MSW8 Subwoofer	$104
Yamaha YST/MSW10 Subwoofer	$154
Yamaha TS51B-True 5.1 Surround Sound System	$421

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Brother HL-1250 12ppm 4M Laser	$647
Brother HL-1270N 12ppm 4M Laser	$890
Brother MP-21C Portable InkJet Printer	$533
Brother MFC-970MC All-in-One Colour InkJet	$494
Brother MFC-7400C All-in-One Colour InkJet	$834
Brother MFC-4600 Fax/Printer/Copier Laser	$979
Brother MFC-8600 All-in-One Laser	$1,308
Canon BJC-55 Portable (opt. Scanner)	$571
Canon BJC-85 Portable	$351
Canon BJC-1000SP	$113
Canon BJC-2100SP 5ppm	$152
Canon S400	$219
Canon S450	$290
Canon S800	$564
Canon BJC-4500 (A3)	$596
Canon BJC-4650 (A3) (opt. Scanner)	$400
Canon LBP- 810 12ppm Laser	$500
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Canon LBP810W 8ppm (USB & PARR)	$506
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Epson Stylus Photo 1290 (A3+)	$971
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Epson EPL-5800	$641
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Epson AL-C2000P colour laser	$2,289
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HP DeskJet 840C	$227
HP DeskJet 930C	$272
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HP OJ K60	$800
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Kyocera FS-1000 PLUS	$655
Kyocera FS-1000TB	$862
Panasonic KX-P6100	$333
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Xerox DocuPrint M750	$363
Xerox DocuPrint M760	$386
Xerox DocuPrint P1210 12ppm	$703
Xerox WorkCentre 385 4-in-1 Laser	$986

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Acer 620ST SCSI (600x1200) (Trans)	$290
Acer 1240UT (1200x1200) (Trans)	$357
Acer 3300u (600x1200)	$119
Acer ScanWit 2720S Film Scanner	$677
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Canon CanoScan N650U USB (600x1200)	$184
Canon CanoScan N660U USB (600x1200)	$282
Canon CanoScan FB1230U USB (1200x2400)	$399
Canon CanoScan N1240U USB (1200x2400)	$301
Epson Perfection1250 USB (600x2400)	$219
Epson Perfection 1250 photo USB (1200x2400)	$461
Epson Perfection 1650	$356
Epson Perfection 1650 Photo	$449
Epson Expression 1680 SCSI & USB (1600x3200)	$2,014
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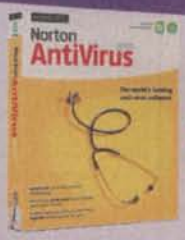

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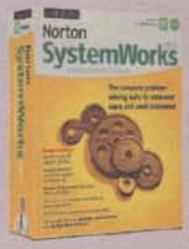

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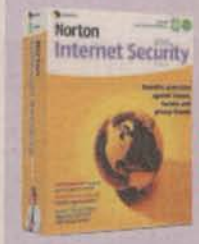

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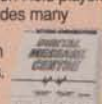

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CANON BJC-3000/6000/8000 Series	12	46-BKL
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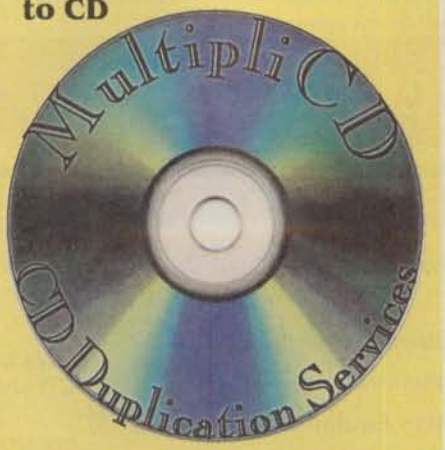

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